NP-3725/3525/3225/3025

SERVICE MANUAL

REVISION 0 MAY 1988

Canon
FY8-1383-000

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CANON NP-3725/3525/3225/3025 REV.0 MAY 1988 PRINTED IN JAPAN

I. FEATURES

1. Automatic two-color overlay copying

The compact NP-3725/3525 can make two-color overlays automatically. Two built-in developing units allow two-color overlay copying by combining black and one other color. The desired operation is selected by using the keys on the control panel.

There are four CD unit choices: red, blue, green and brown.

2. Automatic color conversion copying

Trimming and masking can be specified by using the area settings, and six different copy modes can be selected by using the copy COLOR CONVERSION SELECTION key.

Two-color copies can be made, using a specified color for an area to be emphasized, and black for the rest of the copy.

Use of the image editing unit (optional) facilitates the specification of area settings (NP-3725/3525 only).

3. Automatic two-sided copy function

The holding tray allows automatic two-sided copying, one copy at a time.

Use of the duplexing unit (optional) enables automatic two-sided copying of up to 30 continuous copies.

4. Automatic functions facilitate the copying process

Automatic paper selection and automatic reproduction ratio selection are enabled by document detection sensors.

The automatic density control function produces copies with appropriate density, even for blueprints and newspapers.

5. Two-page separation function

In addition to the regular two-page separation function, the copier is capable of several easy-to-use copying combinations: two-page separation two-sided copying, two-page separation overlay copying, and two-page separation color overlay copying.

6. Full range of basic functions

- Copying speed NP-3725/3525: 27 letter-size (A4) sheets per minute
  NP-3225/3025: 25 letter-size (A4) sheets per minute
- Variable reproduction ratios from 64% ~ 156% in 1% steps, plus three fixed reduction and enlargement ratios (See Note)
- Control panel key selection of four different copy colors
- A wide range of paper types, in sizes from A3/Ledger to postcard-size, can be used.
- Three ways to feed paper: two cassettes and a multifeeder

Note: NP-3725/3225 have variable reproduction ratios from 64% ~ 200% in 1% steps.

7. Numerous special functions simplify the copying process

- Automatic reproduction ratio calculation
- Sheet frame erasing
- Document orientation indicator
- Reproduction ratio memory
- Sorting
- Binding margins
- Grouping

8. Optional equipment simplifies and automates the copying process

- DF/ADF/RF-I
- 10-bin sorter (for the NP-3000 SERIES)
- Paper deck
- Image editing unit (NP-3725/3525 only)
- Control card III
- Duplexing unit (NP-3725/3525 only)

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II. SPECIFICATIONS

	Item		NP-3525	NP-3725	NP-3025	NP-3225
Type	Copier		Desk-top			
	Copyboard		Fixed			
	Light source		Tungsten-halogen lamp (230W)			
	Optical system		Lens with fixed and moving mirrors (floating element lens)			
	Photosensitive material		OPC			
Copying system	Copying process		Indirect electrostatic copying			
	Charging		Corona			
	Exposure		Slit aperture (scanning)			
	Copy density control		Automatic or manual			
	Development		Dry			
	Paper supply	Automatic	Two cassettes or cassette plus paper deck			
		Manual	Multifeeder		Manual feeder	
	Transfer		Corona			
	Separation		Corona (electrostatic separation)			
	Cleaning		Blade			
	Fixing		Heated rollers (800W + 400W or 1200W)			
Functions	Types of original		Sheets, books, 3-dimensional objects (up to 2 kg/4.4 lb)			
	Maximum document size		A3 (297×420mm)/Ledger (11″×17″)			
	Reproduction ratio	Direct	1:1 (±0.5%)			
		Reduction I	1:0.707 (220/240V) or 1:0.647 (165V)			
		Reduction II	1:0.816 (220/240V) or 1:0.730 (115V)			
		Reduction III	1:0.867 (220/240V) or 1:0.786 (115V)			
		Enlargement I	1:1.414 (220/240V) or 1:1.560 (115V)			
		Enlargement II	1:1.226 (220/240V) or 1:1.294 (115V)			
		Enlargement III	1:1.154 (220/240V) or 1:1.214 (115V)			
		1% steps	1:0.640~1.560	1:0.640~2.000	1:0.640~1.560	1:0.640~2.000
	Warm-up time		90 seconds (20°C/68°F)			
	First copy		7 seconds (A4/Letter)			
	Continuous Copying		Up to 99 sheets			
	Copy sizes		Max: A3/Ledger Min: Standard postcard (105×148mm/4.1×5.8″)			
	Copy paper	Cassette feed	Plain paper 64 to 80 g/m² (16 to 21lb), tracing paper, colored paper			
		Manual feed	Plain paper 40 to 128 g/m² (10.5 to 33 lb), tracing paper, colored paper, OHP film, regular and homemade postcards, labels			
	Two-sided copying	Automatic feed	Plain paper 64 to 80 g/m², (16 to 21 lb), colored paper		–	
		Manual feed	Plain paper 64 to 80 g/m² (16 to 21 lb), regular and homemade postcards, colored paper			
	Overlay copying	Automatic feed	Plain paper 64 to 80 g/m² (16 to 21 lb), colored paper		–	
		Manual feed	Plain paper 64 to 80 g/m² (16 to 21 lb), regular and homemade postcards, colored paper			

* In the NP-3525 copier, tracing paper and OHP film are fed one at a time into the multifeeder tray.

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	Item		NP-3725/3525	NP-3225/3025
Functions	Cassette type	Hold-down tabs	Not used	Used
		Standard	Loading depth: 27 mm (approx. 250 sheets, 80 g/m²)	
		Universal	Loading depth: 27 mm (approx. 250 sheets, 80 g/m²)	Loading depth: 20 mm (approx. 200 sheets, 80 g/m²)
	Copy tray capacity		Approx. 100 sheets (A4/Letter size, 80 g/m²)	
	Non image area	Leading edge blank area	2.5 ± 1.5 mm	
		Left and right blank strips	2.0 ± 1.0 mm	
	Automatic return to standard mode		Possible (2 min standard return, can be set in 1 min increments in range from 1 to 60 minutes)	
	Auto shut-off		Not possible	
	Options		Pedestal P:	Pedestal A: Sorter, paper deck, duplexing unit
			DF/ADF/RF-I CD unit Duplexing unit Image editing unit Control card and counter	Pedestal P: DF/ADF CD unit Control card and counter Pedestal A: Sorter, paper deck
Others	Operating environment	Temperature	7.5 – 32.5°C (45.5 – 90.5°F)	
		Relative humidity	10 – 85%	
		Barometric pressure	0.6 – 1 atm	
	Power consumption	During copying	100/115 V MAX. 1.5 kW	220/240 V MAX. 1.6 kW
		During STANDBY	Avg. 0.18 kW	
		During continuous copying	Avg. 0.89 kW (A4/Letter)	
	Sound level	During copying	55 dB or less (1m from machine)	
		During STANDBY	40 dB or less (1m from machine)	
	Ozone		0.1 ppm max (average over 8 hrs)	
	Dimensions	Width	680mm (26.8 in)	680mm (26.8 in)
		Depth	690mm (27.2 in)	690mm (27.2 in)
		Height	370mm (14.6 in)	370mm (14.6 in)
	Weight		73 kg (161 lb)	63 kg (139 lb)
	Storage of copier supplies	Copy paper	Store unused paper inside its original wrapping to protect it from humidity.	
		Toner	Do not store toner in direct sunlight, at temperatures above 40°C (104°F) or above 85% humidity.	
		Developing assembly (CD unit)	Keep the developing assembly in its storage box. Do not store at temperatures above 30°C (86°F) or above 85% humidity.	

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Reproduction ratio		Size	Cassette	Copy speed (copies/min)	
				NP-3725 /3525	NP-3225 /3025
Direct		A3	A3	15	15
		A4	A4	27	25
		B4	B4	17	17
		B5	B5	30	26
		Ledger (11" x 17")	Ledger	15	15
		Legal	Legal	18	17
		Letter	Letter	27	25
		Mini	Mini	26	25
	NP-3725 /3525	US [176 – 230mm / 251 – 290mm] [176 – 230mm / 128 – 158mm]	US	25	
		UL [307 – 370mm / 193 – 226mm]	UL	17	
	NP-3225 /3025	U1 [203 – 220mm / 317 – 360mm]	U1		17
		U2 [128 – 148mm / 182 – 216mm]	U2		25
		U3 [257 – 280mm / 182 – 220mm]	U3		24
Reduction	I	A3 → A4	A4R	20	18
		B4 → B5	B5R	22	21
		Ledger → Letter	Letter-R	20	19
	II	B4 → A4	A4R	20	19
		Ledger → Legal	Legal	18	17
		11" x 15" → Letter	Letter-R	21	19
	III	A3 → B4	B4	17	16
		A4 → B5	B5	30	25
		Legal → Letter	Letter-R	21	19
Enlargement	I	A4 → A3	A3	16	15
		B5 → B4	B4	18	17
	II	A4 → B4	B4	18	17
		Letter → Ledger	Ledger	15	15
		Mini → Letter	Letter-R	22	20
	III	B4 → A3	A3	16	15
		B5 → A4	A4	27	26
		Legal → Ledger	ledger	15	15

Table 1-1

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NP-3525 Power Source

Voltage	Serial number						
	NP-3525	With DF	With ADF	With Image Editing Unit	With RDF	With EDF	With EADF
115V 60Hz	CAXxxxxx CCHxxxxx CCNxxxxx CITxxxxx	CAZxxxxx CCJxxxxx CCPxxxxx CIVxxxxx		CCVxxxxx CFLxxxxx CIZxxxxx		CEMxxxxx CJCxxxxx	
220V 50Hz	DAXxxxxx DCHxxxxx DCNxxxxx DITxxxxx						
							EFDxxxxx EFMxxxxx
	GAXxxxxx GCHxxxxx GCNxxxxx GITxxxxx						
	HAXxxxxx HCHxxxxx HCNxxxxx HITxxxxx	HAZxxxxx HCJxxxxx HCPxxxxx HIVxxxxx					HJBxxxxx
240V 50Hz							DFDxxxxx DFMxxxxx
	EAXxxxxx ECHxxxxx ECNxxxxx EITxxxxx FAXxxxxx FCHxxxxx FCNxxxxx FITxxxxx	EAZxxxxx ECJxxxxx ECPxxxxx EIVxxxxx FAZxxxxx FCJxxxxx FCPxxxxx FIVxxxxx	EBBxxxxx ECKxxxxx ECQxxxxx EIWxxxxx	EFVxxxxx EIZxxxxx	EFWxxxxx EJDxxxxx		EJBxxxxx
127V 60Hz	IAXxxxxx IITxxxxx						

Table 1-1A

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NP-3025/3225 Power source

Voltage	Serial number (NP-3025)			Serial number (NP-3225)		
	NP-3025	With DF	With ADF	NP-3225	With DF	With ADF
115V 60Hz	CAYxxxxx CCIxxxxx CCOxxxxx CIUxxxxx	CBCxxxxx CCLxxxxx CCRxxxxx CIXxxxxx		CJSxxxxx	CJTxxxxx	
220V 50Hz	DAYxxxxx DCIxxxxx DCOxxxxx DIUxxxxx			DJSxxxxx		
	GAYxxxxx GCIxxxxx GCOxxxxx GIUxxxxx			GJSxxxxx		
	HAYxxxxx HCIxxxxx HCOxxxxx HIUxxxxx	HBCxxxxx HCLxxxxx HCRxxxxx HIXxxxxx		HJSxxxxx	HJTxxxxx	
240V 50Hz	EAYxxxxx ECIxxxxx ECOxxxxx EIUxxxxx	EBCxxxxx ECLxxxxx ECRxxxxx EIXxxxxx	EBDxxxxx ECMxxxxx ECSxxxxx EIYxxxxx	EJSxxxxx	EJTxxxxx	EJUxxxxx
	FAYxxxxx FCIxxxxx FCOxxxxx FIUxxxxx	FBCxxxxx FCLxxxxx FCRxxxxx FIXxxxxx		FJSxxxxx	FJTxxxxx	

Table 1-1B

NP-3725 Power source

Voltage	Serial number						
	NP-3725	With DF	With ADF	With Image Editing Unit	With RDF	With EDF	With FADF
115V 60Hz	CJMxxxxx	CJNxxxxx				CKTxxxxx	
220V 50Hz	DJMxxxxx						
	GJMxxxxx						
	HJMxxxxx	HJNxxxxx					HJRxxxxx
240V 50Hz	EJMxxxxx	EJNxxxxx	EJOxxxxx	EJPxxxxx	EJQxxxxx		EJRxxxxx
	FJMxxxxx	FJNxxxxx	FJOxxxxx		FJQxxxxx		

Table 1-1C

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Paper size	Cassette	Dimensions	
		(mm)	(inches)
A3	A3	297 × 420	11.7 × 16.5
A4	A4	210 × 297	8.3 × 11.7
A5	U2, US	148.5 × 210	5.8 × 8.3
B4	B4	257 × 364	10.1 × 14.3
B5	B5, U3, US	182 × 257	7.2 × 10.1
B6	U2, US	128.5 × 182	5.1 × 7.2
Legal	Legal, U1, US	216 × 356	8.5 × 14.0
U.S. Gov't. Legal	U1, UL	203 × 330	8 × 13
Ledger (11″×17″)	Ledger	279.4 × 431.8	11 × 17
Foolscap	U1, UL	216 × 330	8.5 × 13
Austr. Foolscap	U1, UL	206 × 337	8 1 × 13.3
Folio	U1, UL	210 × 330	8.3 × 13
Officio	U1, UL	216 × 317	8.5 × 12.5
Argent. Legal	U1, UL	220 × 340	8.7 × 13.4
		220 × 350	8 7 × 13.8
Letter	Letter	216 × 279	8.5 × 11.0
Mini	Mini, U3, US	139.5 × 216	5.5 × 8.5
Argent. Letter	U3, US	220 × 280	8.7 × 11.0
U.S. Gov't. Letter	U3, US	203 × 267	8 × 10.5

Table 1-2

Information in this manual is subject to change with improvement or redesign of the copier.

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III. PARTS OF THE COPIER

A. External View

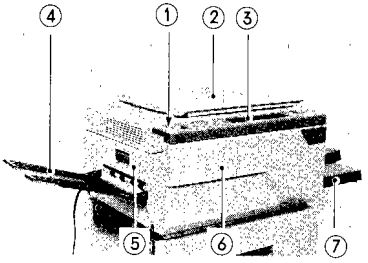

Figure 1-1

① Power switch
② Copyboard cover
③ Control panel
④ Copy tray
⑤ Delivery area door
⑥ Front door
⑦ Cassette

NP-3725/3525

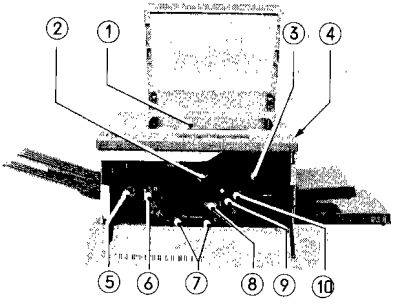

Figure 1-2

① Copyboard glass
② Primary corona assembly
③ Hopper (Black toner)
④ Multifeeder tray
⑤ Fixing assembly knob
⑥ Feeder assembly release handle
⑦ Two-sided copying holding tray release handle
⑧ Transfer and separation corona assembly
⑨ Pre-transfer corona assembly
⑩ Black developing unit

NP-3225/3025

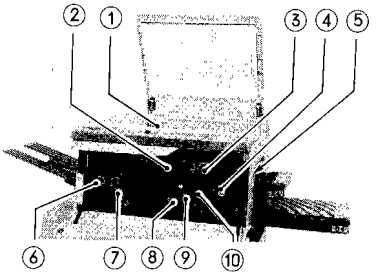

Figure 1-3

① Copyboard glass
② Primary corona assembly
③ Color developing unit (CD unit)
④ Hopper (Black toner)
⑤ Manual feed selection lever
⑥ Fixing assembly knob
⑦ Feeder assembly release lever
⑧ Transfer and separation corona assembly
⑨ Pre-transfer corona assembly
⑩ Black developing unit

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B. Internal View

1. NP-3725/3525

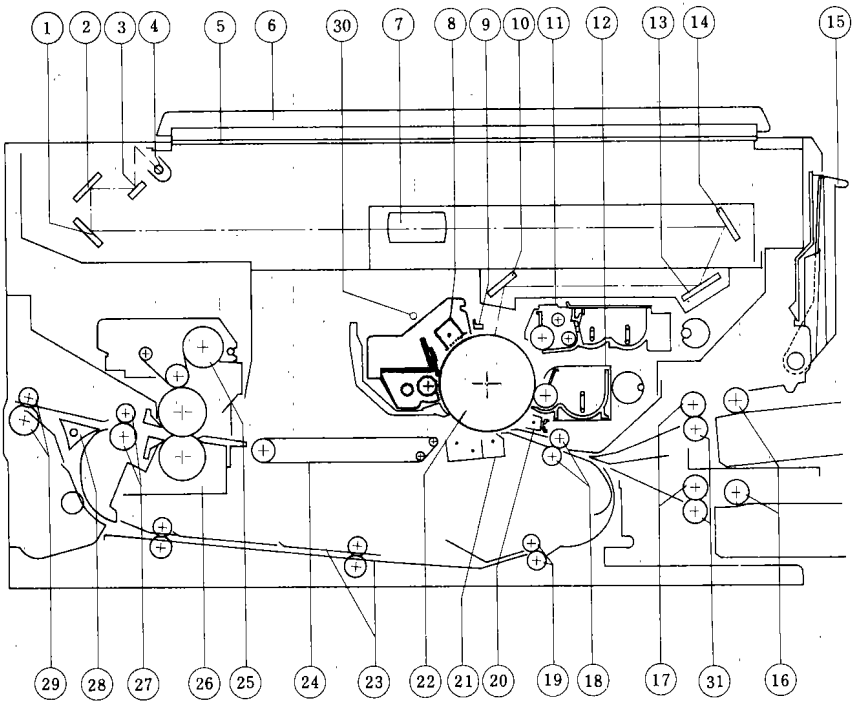

Figure 1-4a

1 Mirror 3
2 Mirror 2
3 Mirror 1
4 Scanning lamp
5 Copyboard glass
6 Copyboard cover
7 Lens
8 Primary corona assembly
9 Blank exposure lamp assembly
10 Mirror 6
11 CD unit (color developing assembly)
12 Black developing assembly
13 Mirror 5
14 Mirror 4
15 Multifeeder tray
16 Upper pick-up rollers
17 Feed roller
18 Registration roller 1
19 Registration roller 2
20 Pre-transfer corona assembly
21 Transfer/separation corona assembly
22 Drum unit
23 Duplexing feeder unit
24 Feeder belt
25 Cleaning belt
26 Fixing assembly
27 Fixing assembly delivery rollers
28 Deflector
29 Delivery rollers
30 Pre-exposure lamp
31 Separation roller

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2. NP-3225/3025

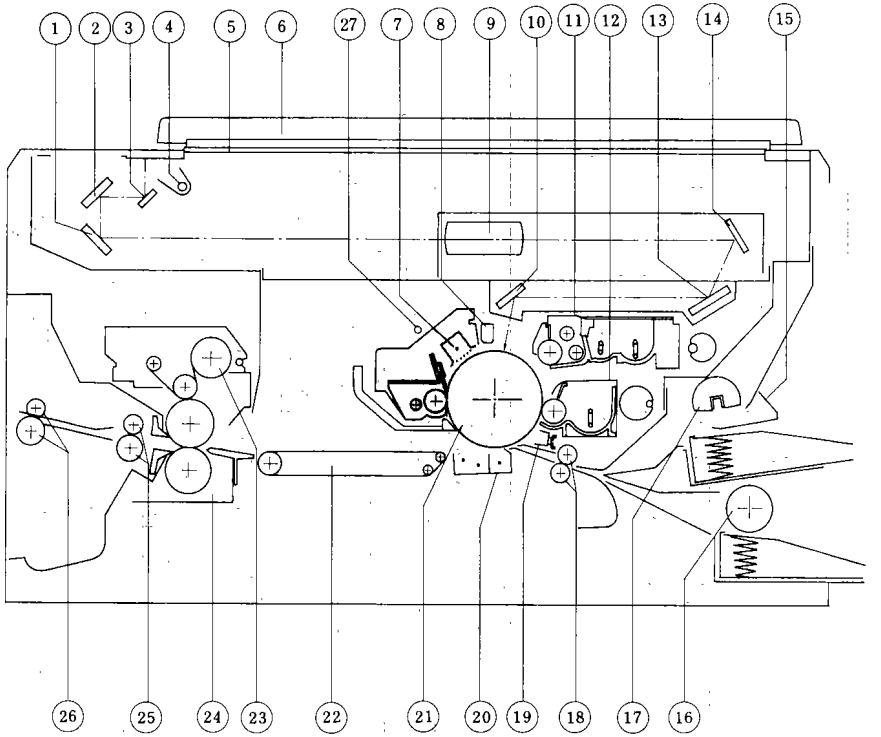

Figure 1-4b

1 Mirror 3
2 Mirror 2
3 Mirror 1
4 Scanning lamp
5 Copyboard glass
6 Copyboard cover
7 Primary corona assembly
8 Blank exposure lamp assembly
9 Lens
10 Mirror 6
11 CD unit (color developing assembly)
12 Black developing assembly
13 Mirror 5
14 Mirror 4
15 Manual feed tray
16 Lower-cassette pick-up roller
17 Upper-cassette pick-up roller
18 Registration rollers
19 Pre-transfer corona assembly
20 Transfer/separation corona assembly
21 Drum unit
22 Feeder belt
23 Cleaning belt
24 Fixing assembly
25 Fixing assembly delivery rollers
26 Delivery rollers
27 Pre-exposure lamp

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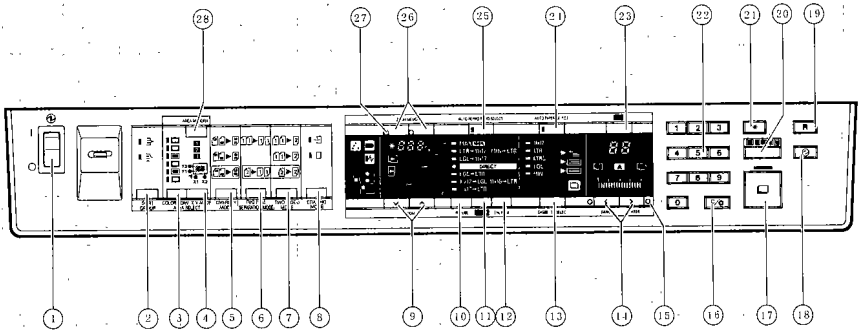
IV. OPERATION

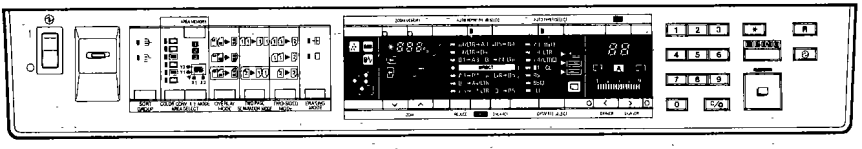
A. Control Panel

1. Keys

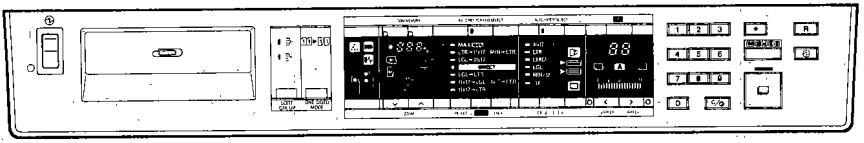
NP-3525 (115V)



NP-3525 (220/240V)



NP-3025 (115V)



NP-3025 (220/240V)

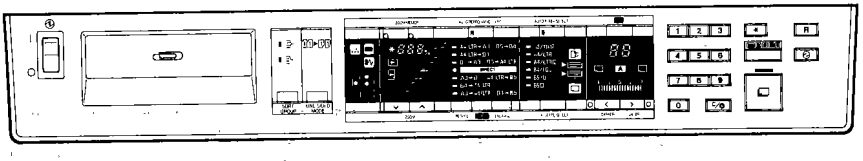


Figure 1-5

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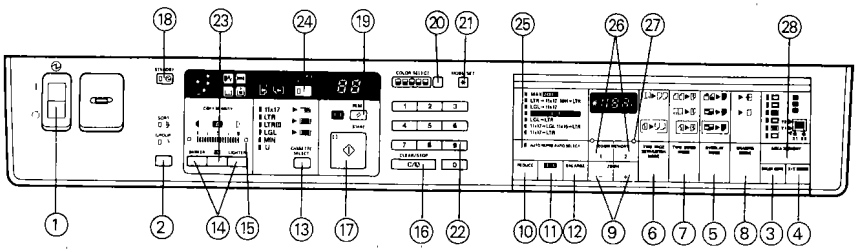
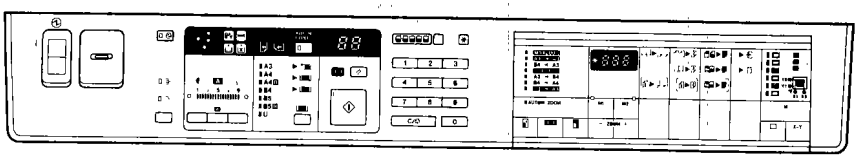
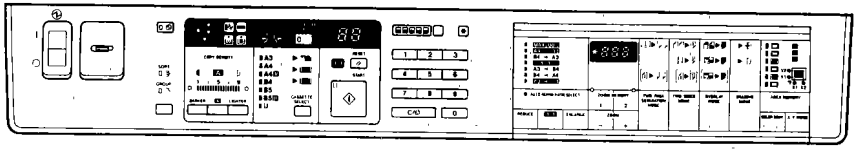
NP-3725 (115V/60Hz)



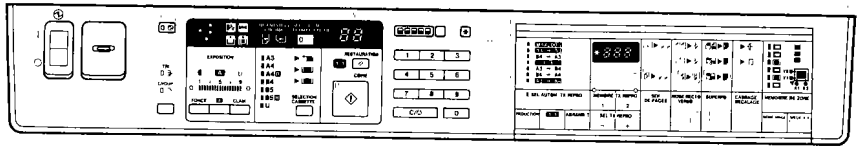
NP-3725 (220V/50Hz, EUR)



NP-3725 (240V/50Hz, UK)



NP-3725 (220V/50Hz, FRN)



NP-3725 (220V/50Hz, 240V/50Hz)

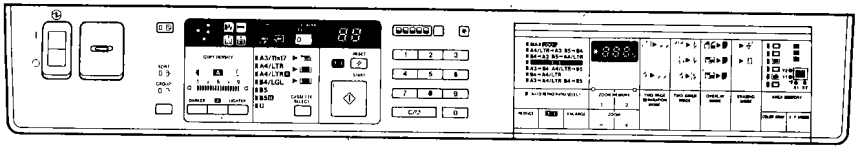


Figure 1-5a

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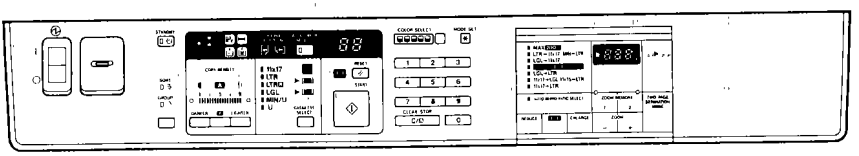
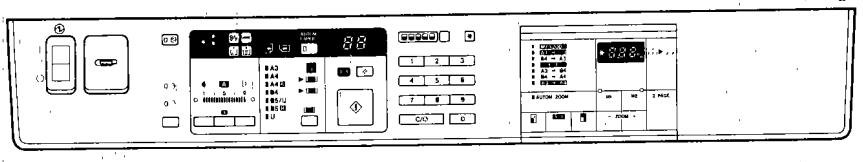
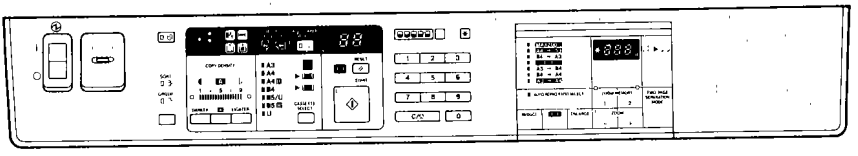
NP-3225 (115V/60Hz)



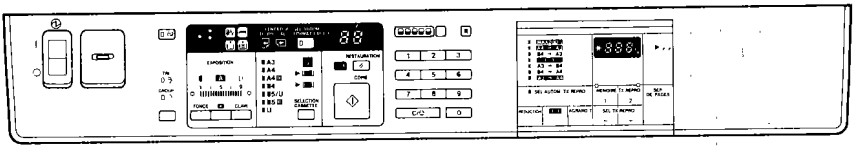
NP-3225 (220V/50Hz, EUR)



NP-3225 (240V/50Hz, UK)



NP-3225 (220V/50Hz, FRN)



NP-3225 (220V/50Hz, 240V/50Hz)

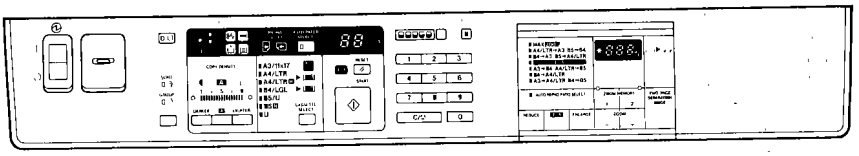


Figure 1-5b

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(1) Power switch
(2) SORT/GROUP key
This key is used to select the Sort or Group mode. When the SORT indicator is lit, Sort Mode is selected.
(3) COPY COLOR CONVERSION SELECTION key
This key is used to select one of six color conversion modes to copy a specified area.
(4) X-Y MODE key
This key is used to designate a rectangular area on the original by specifying its X and Y coordinates.
(5) IMAGE OVERLAY key
This key is used to select one of three overlay copy modes.
(6) TWO-PAGE SEPARATION COPY MODE key
separate sheets of copy paper. The NP-3725/3525 with RDF-I can make two separate copies from a two-sided original.
(7) TWO-SIDED COPY MODE key
This key is used to make a two-sided copy from two separate one-sided originals or to make a two-sided copy of the two pages of an open book or magazine.
The NP-3725/3525 with RDF-I can make a two-sided copy from a two-sided original.
(8) ERASING MODE key
This key is used to erase the marks that are ordinarily made on a copy by the center binding of a book or to erase the area around the perimeter of a copy to leave a margin.
(9) VARIABLE REPRODUCTION RATIO keys
This key is used to select copy reproduction ratios between 64% and 156% in 1% increments.
NP-3725/3225: between 64% and 200%
(10) REDUCTION key
(11) DIRECT COPY key
(12) ENLARGEMENT key
(13) CASSETTE SELECTION key
(14) MANUAL DENSITY CONTROL keys
(15) DENSITY RECALIBRATION keys
These button are used to adjust the density range controlled by the MANUAL DENSITY CONTROL keys.
(16) CLEAR/STOP key
(17) COPY START key
(18) STANDBY/PRE-HEAT key
This key switches the copier between the STANDBY and PRE-HEAT modes In PRE-HEAT mode, all indicators except for the STANDBY/PRE-HEAT indicator are out and copying is not possible. Press the key again to return to STANDBY.
(19) STANDARD MODE key
This key is used to reset the copier to standard mode.
Standard mode sets the copier as follows:
Copy number display 1
Reproduction ratio 100%
AE mode
Black developing unit
Automatic paper selection
(20) COLOR SELECTION key
This key is used to select the developing assembly to be used.
(21) ASTERISK key
This key is used when using the Variable Reproduction Ratio Program Function to calculate a reproduction ratio.
(22) INPUT keyboard
(23) AUTOMATIC DENSITY CONTROL key
(24) AUTOMATIC PAPER SELECTION key
When this key is pressed, the copy size that is the best fit for the original is automatically selected and a copy is made at the specified reproduction ratio.
(25) AUTOMATIC REPRODUCTION RATIO key
When this key is pressed, the reproduction ratio that corresponds to the difference in size between the original and the specified copy paper is automatically selected and a copy is made at that ratio.
(26) VARIABLE REPRODUCTION RATIO MEMORY keys
These keys are used to recall the reproduction ratio settings stored in memory.
(27) MEMORY INPUT keys
These keys are used to store the settings of specified reproduction ratios in memory.
(28) AREA MEMORY key
The coordinates of an area can be stored in memory. This key is used to recall the stored area setting.

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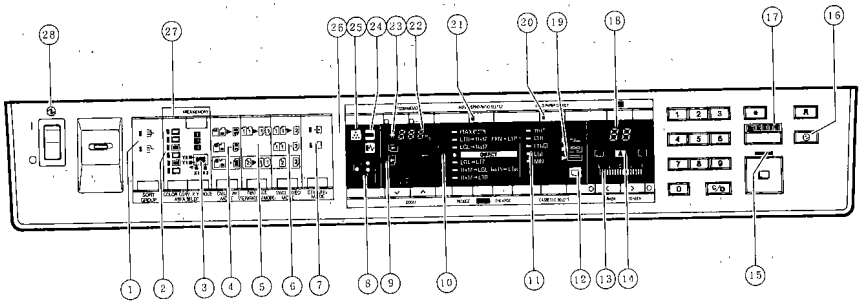
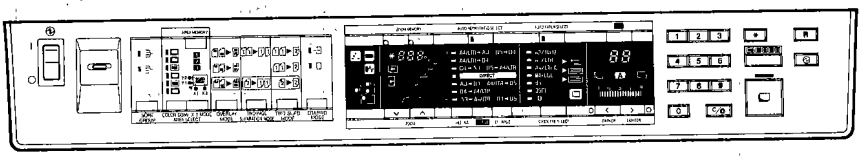
2. Indicators

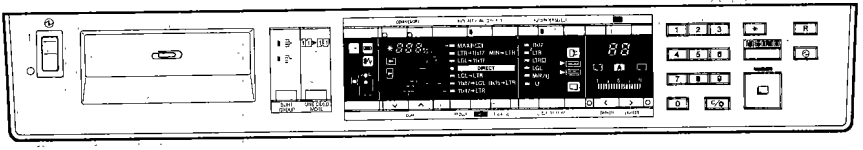
NP-3525 (115V)



NP-3525 (220/240V)



NP-3025 (115V)



NP-3025 (220/240V)

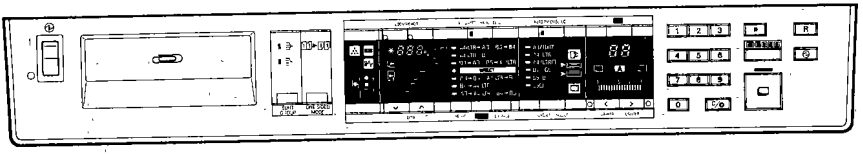


Figure 1-6

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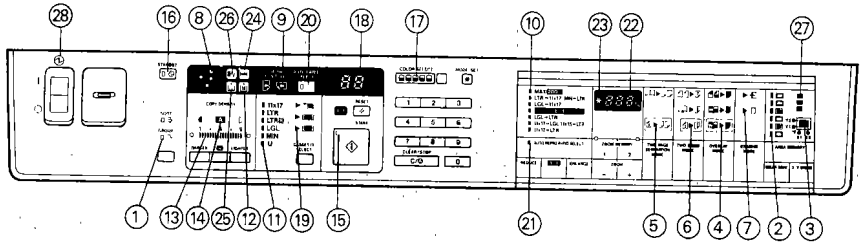
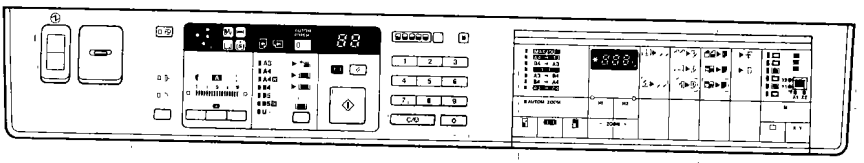
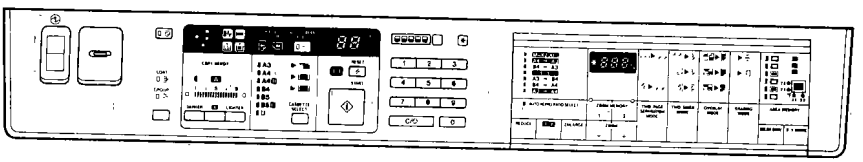
NP-3725 (115V/60Hz)



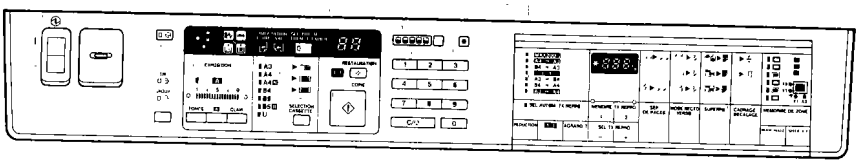
NP-3725 (220V/50Hz, EUR)



NP-3725 (240V/50Hz, UK)



NP-3725 (220V/50Hz, FRN)



NP-3725 (220V/50Hz, 240V/50Hz)

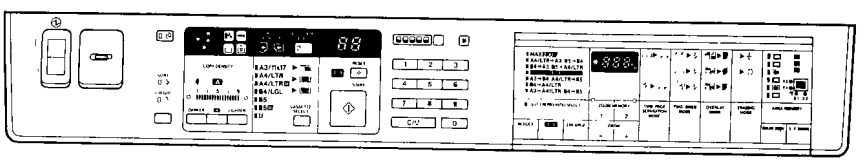


Figure 1-6a

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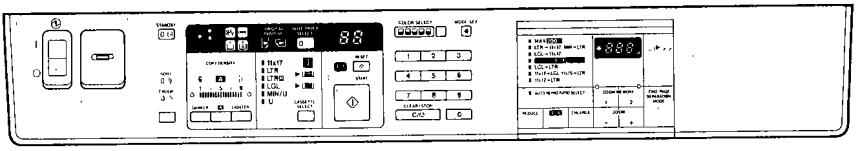
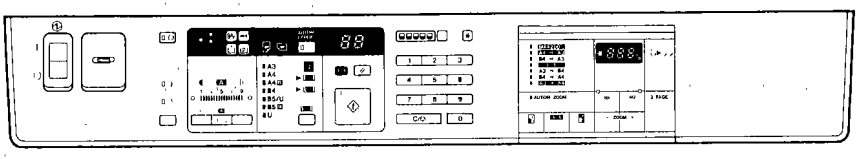
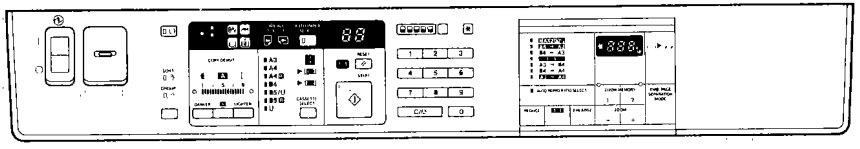
NP-3225 (115V/60Hz)



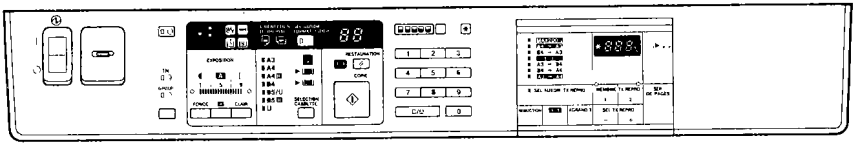
NP-3225 (220V/50Hz, EUR)



NP-3225 (240V/50Hz, UK)



NP-3225 (220V/50Hz, FRN)



NP-3225 (220V/50Hz, 240V/50Hz)

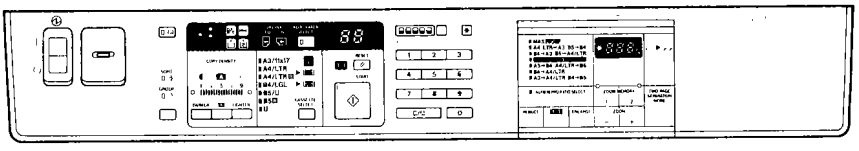


Figure 1-6b

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(1) SORT MODE indicators

SORT indicator

GROUP indicator

Figure 1-7

(2) COPY COLOR CONVERSION indicators
These six indicators display the selected copy color.

	Color of area	Color outside area
	Colored	Black
	Black	Colored
	Black	White
	White	Black
	Colored	White
	White	Colored

Table 1-3

(3) X-Y indicators

When the coordinates of an area are being set, these indicators flash to show which coordinate should be entered.

Figure 1-8

(4) OVERLAY MODE indicators

OVERLAY indicator

TWO-PAGE OVERLAY indicator

TWO-PAGE OVERLAY WITH TWO-COLOR indicator (This indicator lits when the copier has RDF-I)

Figure 1-9

(5) Two-page copy mode indicators

TWO-PAGE SEPARATION indicator

TWO-SIDED ORIGINAL TO TWO ONE-SIDED COPIES indicator

Figure 1-10

(6) Two-sided copy mode indicators

ONE-SIDED ORIGINAL TO TWO-SIDED COPY indicator

TWO-PAGE TO TWO-SIDED COPY indicator

TWO-SIDED ORIGINAL TO TWO-SIDED COPY indicator (This indicator lits when the copier has RDF-I)

Figure 1-11

(7) Erasing mode indicators

BINDING MARGIN indicator

SHEET FRAME ERASING indicator

Figure 1-12

(8) JAM LOCATION indicator

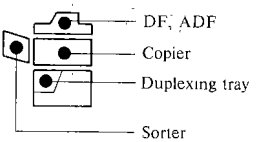

Figure 1-13

(9) DOCUMENT ORIENTATION indicator

Original is placed lengthwise on the copyboard.

Original is placed widthwise on the copyboard.

Figure 1-14

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(10) FIXED REPRODUCTION RATIO indicator

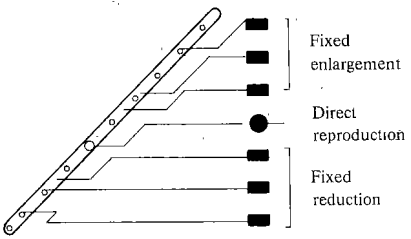

Figure 1-15

(11) CASSETTE SIZE indicator

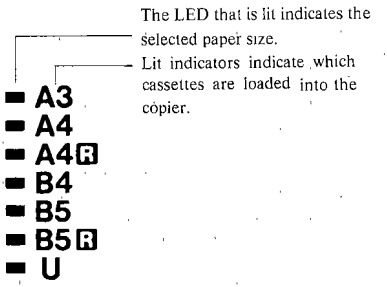

Figure 1-16

(12) PAPER OUT indicator

This indicator lights if the selected cassette is not in the copier or if there is no paper in it.

Figure 1-17

(13) DENSITY indicator

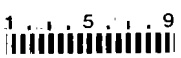

Figure 1-18

(14) AUTOMATIC DENSITY CONTROL indicator

This indicator lights when automatic density control mode is selected.

Figure 1-19

(15) WAIT indicator

This indicator lights red during warm-up and lights green when the copier is in STANDBY.

(16) STANDBY/PRE-HEAT indicator

This indicator is lit when the copier is in PRE-HEAT mode.

Figure 1-20

(17) COLOR SELECTION indicator

This indicator displays the toner color of the selected developing unit.

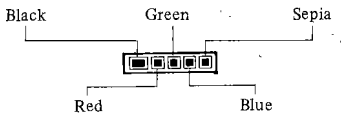

Figure 1-21

(18) COPY NUMBER display

The desired number of copies selected using the INPUT keyboard is displayed on the COPY NUMBER display. During a copy run, the number on the display decreases by one as each copy is made.

(19) Cassette holder indicator

NP-3525/3725

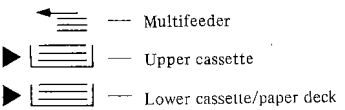

Figure 1-22

NP-3025/3225

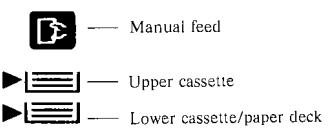

Figure 1-23

(20) AUTOMATIC PAPER SELECTION indicator

This indicator lights when automatic paper selection mode is selected.

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(21) AUTOMATIC REPRODUCTION indicator
This indicator lights when automatic reproduction ratio mode is selected.

(22) REPRODUCTION RATIO/AREA SET display
The selected reproduction ratio is displayed as a percentage value.
When an area is set or a reproduction ratio is programmed into memory, the numbers entered from the INPUT keyboard are displayed.
In service mode, the error codes are displayed.

(23) ASTERISK indicator

This indicator lights if the ASTERISK key is pressed.

(24) CONTROL CARD/COUNTER CHECK indicator
(25) TONER OUT indicator
(26) JAM LOCATION indicator
(27) AREA indicator

When the AREA MEMORY key is pressed, this indicator lights in the sequence [1] → [1] [2] → [1] [2] [3].

Figure 1-24

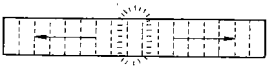
(28) POWER SUPPLY indicator
This indicator lights when the power switch is set to "I".

B. Copying Process

1) Set the power switch to I
   - If the temperature of the fixing assembly is below a certain value, the WAIT indicator lights red.
   - When the assembly temperature rises above this temperature, the WAIT indicator lights green.
   - The normal wait time at a room temperature of 20°C (58°F) is approximately 90 seconds.
2) Lift up the copyboard cover and place the original facedown on the copy board, aligning it with the appropriate index marks.

Note:
Be certain to close the copyboard cover after the original has been positioned. The size of the original is detected while the copyboard cover is closed. Therefore, the automatic reproduction ratio and automatic paper selection functions will not operate if the cover is left open. (This applies only to the NP-3725/3525.)

3) Press the Direct Copy, Reduction, Enlargement or Variable Reproduction Ratio keys to set the desired reproduction ratio.
4) To specify the size of copy paper to be used, select the cassette (upper or lower) that contains the desired paper.
   - If neither of the loaded cassettes is the proper size, replace one with the desired cassette. The copy paper can also be placed in the manual feed tray (NP-3225/3025) or the multifeeder (NP-3725/3525).
5) To adjust the copy density manually, use the MANUAL DENSITY CONTROL keys and set the density to suit the original.
   - To make the copy lighter, press the key marked [<]. The DENSITY indicator light will move to the left. To make the copy darker, press the key marked [>]. The DENSITY indicator light will move to the right.



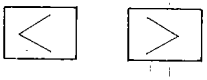


Figure 1-25

6) Use the INPUT keyboard to set the desired number of copies. (1-99). Check the number on the COPY NUMBER display. If the INPUT keyboard fails to set the number, or if the set number is incorrect, press the CLEAR/STOP key and enter the value again.
7) Select the Color Developing (CD) Unit for the desired copy color. Replace the loaded Color Developing Unit if a different copy color is desired.

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8) Press the COPY START key.
- If the document feeder (DF) is used, an original placed on the document feed tray is automatically fed to the copyboard and copied.
- The specified number of copies are made automatically.
- Except for the CLEAR/STOP key or the MANUAL DENSITY CONTROL keys, key input has no effect during the time between the first and last copies in the run.
- Automatic density control mode can be changed to manual density control mode during a copy run. However, it is not possible to change from manual to automatic density control mode.

Example:
If a copy made in automatic density control mode is too dark or too light, the copy should be made using manual density control. Use the setting displayed on the DENSITY indicator for the copy made in automatic density control mode as a reference to determine the correct manual density setting.

- To stop the copying process during continuous copying, press the CLEAR/STOP key. The copier will complete the current copy and stop.
- The COPY NUMBER display will indicate the initial number of copies set.
- If the PAPER OUT indicator lights during copying, the copier will stop until more copy paper has been placed in the cassette, the cassette has been reinserted, and the COPY START key has been pressed. Then, the remaining number of copies will be made.
- If the JAM LOCATION indicator lights during copying, the copier will stop and the COPY NUMBER display will indicate the number or sheets that have jammed inside the copier.
- After the jammed sheets have been removed, the COPY NUMBER display will indicate the initial number of copies set.
- The copier will return to Standard mode approximately two minutes after the completion of a copy run or key operation, if no other operation is performed.

C. Pre-heat Mode

If the STANDBY/PRE-HEAT key is pressed while the copier is in STANDBY, the copier enters PRE-HEAT mode. All indicators except for the STANDBY/PRE-HEAT indicator are turned OFF.

If any operation keys other than the STANDBY/PRE-HEAT key are pressed during PRE-HEAT mode, the related indicator will not light. The temperature control value for the fixing assembly remains the same.

D. Erasing Mode Operations (only NP-3725/3525)

The ERASING MODE key is used to select Binding Margin mode or Sheet Frame Erasing mode.

When a copy is made in Binding Margin mode, a 5 mm wide blank strip is made on the left edge of the copy.

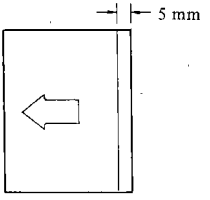

Figure 1-26

When a copy is made in Sheet Frame Erasing mode, a 7 mm wide blank strip is made around the perimeter of the selected copy paper.

Sheet Frame Erasing mode cannot be used during manual feed copying.

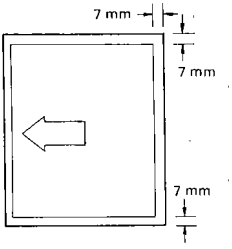

Figure 1-27

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E. Two-sided Copying

1. For NP-3725/3525

The TWO-SIDED COPY MODE key can be used to perform three different types of two-sided copying.

a. Two one-sided originals to two-side copy

The DF and ADF feeders are convenient for feeding in the originals.

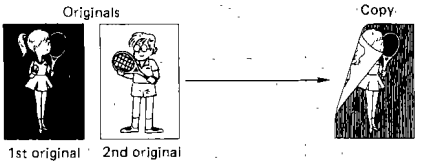

Figure 1-28

b. Two-page to two-sided copy

When copying a number of pages from a book, begin with the last one. Place the higher page number of the open book on the left side (the image leading edge side).

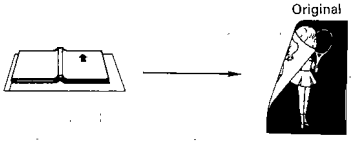

Figure 1-29

c. Two-sided original to two-sided copy

This copy can be made with RDF-I.

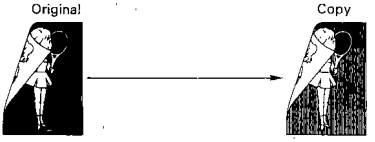

Figure 1-30

2. For NP-3725/3525/3225/3025

Two-sided copies can be made in manual feed mode.

Please note the following concerning two-sided copying in this mode:

1) When turning the copy over after the first side has been copied onto, turn the copy over so that the leading and trailing edges change places. The front and rear edges should not change places. (See Figure 1-31.)
2) Do not use damp paper.
3) Do not used curled paper.

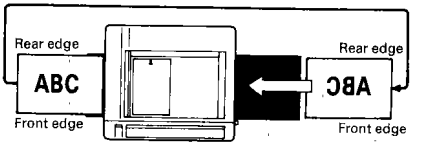

Figure 1-31

F. Two-page Separation Mode

The ONE-SIDED COPY MODE key can be used to perform two types of page separation copying.

1. Two-page original to one-sided copies

Place the higher page number of the open book on the left side (the image leading edge side).

To copy a number of pages from a book, begin copying from the last page.

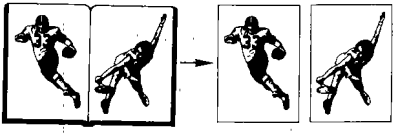

Figure 1-32

2. Two-sided original to one-sided copies

This copy can be made with RDF-I.

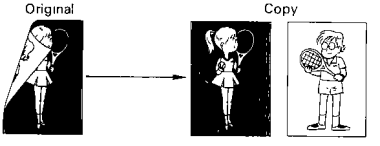

Figure 1-33

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G. Overlay Copying

1. For NP-3725/3525

The IMAGE OVERLAY key can be used to perform three different types of overlay copying.

a. Overlay copying

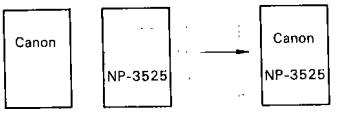

Figure 1-34

The DF and ADF feeders are convenient for feeding in originals one after the other.

b. Two-page overlay copy mode

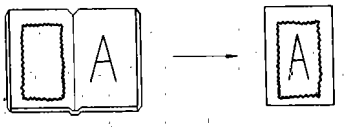

Figure 1-35

c. Two-page overlay with two-color copy mode

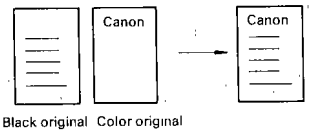

Figure 1-36

The left original is copied in black and the right original is copied in another color.

2. For NP-3725/3525/3225/3025

Overlay copying can be performed in manual feed mode.

Please note the following when making overlay copies in this mode:

1) Do not use damp paper.
2) Do not use curled paper.
3) Let the copy cool off completely before inserting into the copier to make the overlay. (This is especially important for OHP film.)

H. Color Conversion Copying

A rectangular area on the original (Figure 1-37) can be specified, and used as the basis for six types of color conversion copying (Figure 1-38). Up to three areas can be specified.

1. Specifying areas using NP-3725/3525

a. Specifying an area

1) Place the original face up on the copyboard glass.
2) Measure the distance in millimeters from the lower left edge of the original to each of the coordinates that designate the area (X1, X2, Y1, Y2)

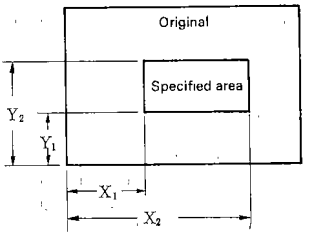

Figure 1-37

3) Turn the original face down on the copyboard glass.
4) Press the AREA MEMORY key.
The AREA indicator will light.
5) Press the X-Y MODE key. The X1 indicator and AREA indicator will flash.
6) Enter the distance X1 using the INPUT keyboard.
If you make a mistake, press the CLEAR/STOP key and enter the value again.
The value entered from the INPUT keyboard will be displayed on the REPRODUCTION RATIO/AREA SET display.
7) Press the X-Y MODE key. The Y1 indicator will light.
Enter the distance Y1 using the INPUT keyboard.
8) Repeat the operations with the X-Y mode key and the INPUT keyboard to enter the distances X2 and Y2.
9) After the four coordinates have been entered, press the X-Y MODE key.
The Y2 indicator will go out.

This operation stores the values in the memory as AREA 1. Repeat steps 1-9 to designate AREA 2 and AREA 3 and store them in memory.

b. Changing an area setting

Use the following procedure to change the values of an area stored in memory.

1) Press the AREA MEMORY key to specify

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which area is to be changed: AREA 1, 2, or 3.

2) Press the X-Y MODE key to select the coordinate to be changed: X1, X2, Y1 or Y2.
The indicator for the selected coordinate will light.

3) Press the CLEAR/STOP key.
Enter the new coordinate using the INPUT keyboard.

4) Press the X-Y MODE key to store the new coordinate in memory.

c. Copying in color conversion mode

1) Enter the coordinates of the area(s) to be copied in color conversion mode.

2) Press the AREA MEMORY key to select which area is to be copied.
AREAS 1, 2, and 3 can be combined for copying as follows:
Possible combinations:
1. Area 1 only
2. Areas 1 and 2
3. Areas 1, 2, 3
No other obminations are possible.

3) Press the COPY COLOR CONVERSION SELECTION key to select the desired copy mode. (See Figure 1-38.)

4) Place the original face down on the copyboard, and press the COPY START key.

2. Specifying areas using the Image Editing Unit

a. Specifying an area

1) Place the original face up on the Image Editing Unit, aligning it with the lower left corner.

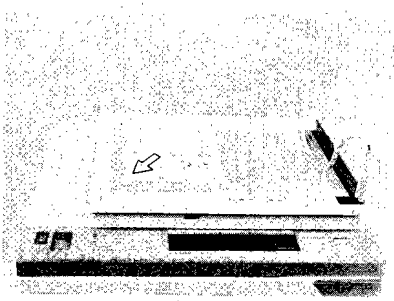
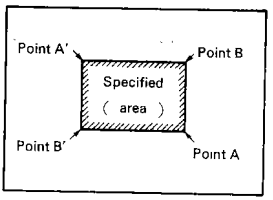


Figure 1-39

2) Touch the tip of the stylus to two points to designate the diagonal of the area that is desired. The coordinates of the rectangle defined by this diagonal are stored in memory.



The area is determined by specifying either A-A' or B-B'.

Figure 1-40

If you make a mistake, simply specify two new points

3) Press the AREA MEMORY key (on image editing unit) with the stylus to input the area specification in memory.
The AREA 1 indicator will light.
Repeat steps 2) and 3) to store AREA 2 and 3 in memory.

b. Copying in color conversion mode

1) Place the original face up on the Image Editing Unit, and specify the area for color conversion copying.
All of the specified areas will be copied in color conversion mode.

2) Press the desired COLOR CONVERSION MODE key (on image editing unit) with the stylus.

3) Place the original face down on the copyboard.

4) Press the COPY START key.

■ Clear key (on Image Editing Unit)
Press the Clear key to erase all of the area specifications from memory.
This cancels color conversion mode.

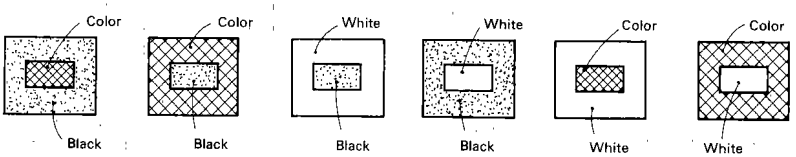


Figure 1-38

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I. Automatic Paper Selection Mode

In this mode, the appropriate paper cassette is automatically selected to correspond to the size of the original and the reproduction ratio, and a copy is made. NP-3225/3025 can use this mode when using DF, ADF or RDF-I.

The copyboard cover must be closed for the copier to detect the size of the original. Make sure that the cover is closed when copying in this mode.

If the cover is left open during copying, the AUTOMATIC PAPER SELECTION indicator will go out, and paper from the lower cassette will be used.

If the appropriate cassette is not in the copier, the cassette with paper that can best contain the image is selected and a copy is made. The indicator for the appropriate cassette will light.

Automatic paper selection mode can be used with the DF, ADF or RDF-I.

J. Automatic Reproduction Ratio Selection Mode

In this mode, the appropriate reproduction ratio is automatically selected to correspond to the size of the original and the size of the copy paper (designated cassette), and a copy is made. NP-3225/3025 can use this mode when using DF, ADF or RDF-I.

The copyboard cover must be closed for the copier to detect the size of the original. Make sure that the cover is closed when copying in this mode.

If the cover is left open during copying, the AUTOMATIC REPRODUCTION indicator will go out, and a direct copy will be made.

If the proper reproduction ratio is too large or small, either 64% or 156%(*1) will flash on the display, and the copy will be made at that reproduction ratio.

Automatic reproduction ratio selection mode can be used with the DF, ADF or RDF-I.

*1 NP-3725/3225 – 200%

K. Variable Reproduction Ratio Memories

If certain reproduction ratios other than the fixed ones (direct, enlargement, reduction) are used frequently, two of the reproduction ratios can be stored in memory. The ratios can then be called when needed by simply pressing the VARIABLE REPRODUCTION RATIO MEMORY key.

1) Using the VARIABLE REPRODUCTION RATIO keys or the Variable Reproduction Ratio Program function, display the reproduction ratio that you wish to program into memory on the REPRODUCTION RATIO/AREA SET display.
2) Press the MEMORY INPUT key with the tip of a ballpoint pen or a similar implement to store the displayed ratio in memory.
3) Press one of the VARIABLE REPRODUCTION RATIO MEMORY keys to recall the stored ratio for verification.

When the MEMORY INPUT key is pressed, the ratio stored previously is cleared, and the currently displayed ratio is stored in its place.

A backup battery system ensures that the contents of memory are not erased when the power switch is turned OFF.

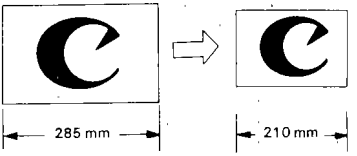
L. Variable Reproduction Ratio Program Function

The size of the original and the size of the desired copy can be input to calculate the correct reproduction ratio.

1) Press the [*] key and check that the ASTERISK MODE indicator is lit
2) Input the size of the original using the INPUT keyboard. The input values will then be displayed on the REPRODUCTION RATIO/AREA SET display.
3) Press the [*] key
4) Input the size of the desired copy as in step 2).
5) Press the [*] key. The correct reproduction ratio will be displayed on the REPRODUCTION RATIO/AREA SET display

If the calculated reporduction ratio is less than 64% or over 156%(*1), 64% or 156%(*1) will flash on the REPRODUCTION RATIO/AREA SET display. If a copy is made, the reproduction ratio will be either 64% or 156%(*1).

*1 NP-3725/3225 – 200%



Size of original Size of desired copy

Figure 1-41

[*] – Enter [2], [8], [5] – [*]
([285] is indicated)
– Enter [2], [1], [0] – [*]
([210] is indicated) (73% is indicated)

Note:
When using the Variable Reproduction Ratio Program function to set a value, the value on the display can be cleared and Asterisk Mode exited by pressing the CLEAR/STOP key. The ASTERISK MODE indicator will then go out.

M. Manual Paper Feed

When making a copy on a different type or size of paper than that contained in the cassettes, the following procedure can be used to avoid the trouble of changing cassettes.

1. NP-3725/3525

1) Open the multifeeder.
2) Place the required number of sheets on the

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multifeeder tray with the side to be copied on face up. Paper sizes in the range from A3/Ledger to standard postcard size (105 × 148 mm/4.1 × 5.8 in) can be used.

A stack of copy paper up to 5 mm high (about 50 sheets-80 g/m²) can be placed on the multifeeder tray at one time.

3) Align the sheets with the guides and push the stack in as far as it will go.
When using postcard size or other small paper, adjust the sliding guide to correspond to the paper size.
4) Set the desired reproduction ratio.
5) Select multifeeder mode.
6) If manual density control is desired, press the MANUAL DENSITY CONTROL keys to set copy density to suit the original.
7) Press the COPY START key.

2. NP-3225/3025

1) Press down the Manual Feed lever near the upper cassette.
The MANUAL FEED indicator will light. If the upper cassette is not loaded, the indicator will flash. Manual feed copying is not possible if the upper cassette is not loaded. However, the lower cassette can be selected for copying.
2) Select the desired reproduction ratio.
3) If manual density control is desired, press the MANUAL DENSITY CONTROL keys to set copy density to suit the original
4) Place the desired copy paper with the side to be copied or face up and align it with the front guides on the upper cassette cover. Insert one sheet.
When the copier detects the insertion of the first sheet, it will automatically begin copying.

Notes:

1. If the paper is not aligned properly with the guides, the side-to-side registration will be incorrect.
2. Paper sizes in the range from A3/Ledger size to standard postcard size (105 × 148 mm/4.1 × 5.8 in) can be used.

N. Recalibrating The Density

If copies are consistently too light or too dark in both manual density control mode and automatic density control mode, the developing bias that corresponds to the "5" density setting can be changed so that the "5" setting will give the best quality copies.

1) Place a test sheet on the copyboard.
2) Use the MANUAL DENSITY CONTROL keys to set the DENSITY indicator to "5".
3) Make copies and press the DENSITY RECALIBRATION keys to change the density until the best density is obtained. Now the "5" setting will produce the best density copies.
4) Press the STANDARD MODE key and make a copy.

O. Changing the Color Developing (CD) Unit

1) Open the front door.
2) Swing out the hopper (for black toner).
3) Pull the CD unit out toward you.
4) Lift the CD unit gently by the top handle.

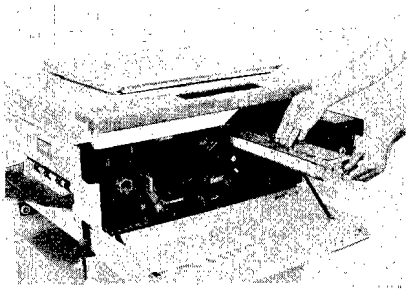

Figure 1-42

5) Set the replacement CD unit carefully in place, and push it in to the copier completely. (See notes)
6) Return the hopper to its original position, and close the door.

Notes:

1. Do not shake the CD unit or place it at an angle or on its side.
2. Do not place the CD unit on the floor, etc. Return it immediately to its storage box after removing it from the copier.
3. Instruct the user to set the CD unit carefully in place and push it fully into the copier. If the CD unit is not fully inserted, drive from the main motor will not be transferred through the gear to drive the CD unit.

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V. WARNING INDICATORS AND OPERATOR RESPONSE

Jam Indicator

If this indicator flashes during a copy run, a paper jam has occurred. The area where the jam occurred is indicated by whatever part of the JAM LOCATION indicator is flashing. Follow the procedure given below to correct the problem.

To remove a paper jam in an optional piece of equipment (sorter, ADF, DF), refer to the relevant Service Manual.

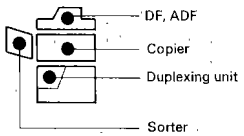


Figure 1-43

If a paper jam occurs inside the copier, first check the pick-up assembly, the separation/feeder area, the fixing/delivery area, the cleaner area, and the holding tray feeder assembly, and remove all jammed papers.

When the copier is ready to copy again, the COPY NUMBER display will show the initial setting for the number of copies.

1) Open the front door.
2) Pull the Delivery Area Release handle on the left side of the copier and gently open the delivery area.

Note:
Remove paper from the copy tray or it will fall into the copier when the delivery area is opened.

3) If paper is jammed in the fixing area, turn the fixing assembly knob clockwise and remove the paper.

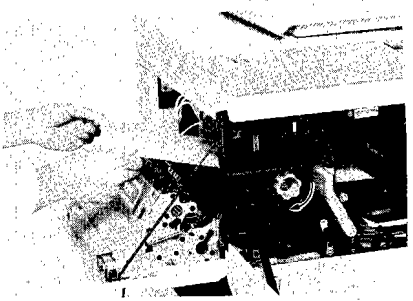


Figure 1-44

4) If paper is jammed in the paper feed guide plate of the delivery area, lift up the paper feed guide plate and remove the sheets.

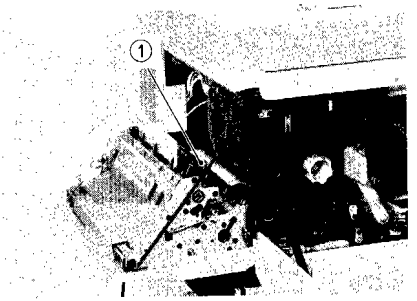
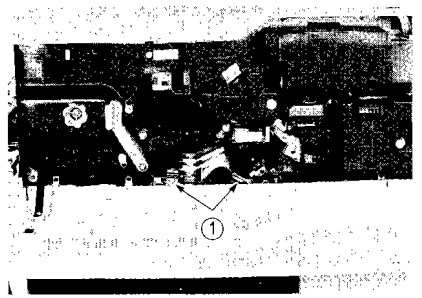


Figure 1-45

① Paper feed guide plate

5) Close the delivery area
6) If paper is jammed in the duplexing feeder assembly, lift the duplexing feeder release handle and remove the sheets.



① Duplexing feeder release handle

Figure 1-46

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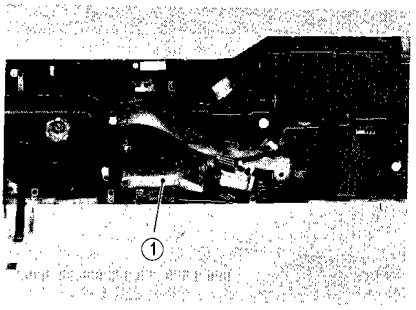
7) If paper is jammed in the separation/feeder assembly, turn the feeder assembly release handle counterclockwise and remove the sheets.



① Feeder assembly release handle

Figure 1-47

8) Paper jammed in the separation/feeder assembly should be removed gently, being careful not to tear it.

Note:
Be especially careful not to touch the photosensitive drum when removing paper from the separation area.

9) Pull out the cassette that was in use, and check the pick-up assembly.
If paper is sticking out from the cassette, remove the paper.
If paper supplied from the multifeeder tray has jammed, remove those papers.
If paper supplied from the paper deck has jammed, open the paper-filling door and push down the lifter deck. Remove the jammed paper and close the paper-filling door.
10) Set the cassette back in place.
11) Push the Jam reset button.
Close the front door.

PAPER OUT Indicator

This indicator will flash if there is no cassette in the selected cassette holder or if there is no paper in the cassette. In manual paper feed mode, the indicator does not light even if there is no paper in the upper cassette.

1. Filling the cassette with copy paper
1) Pull the cassette out of the cassette holder.
2) Place a new supply of paper in the cassette

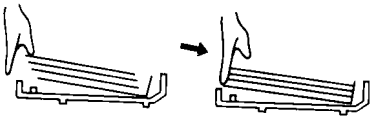


Figure 1-48

3) Reinsert the cassette in the cassette holder.

2. Filling the paper deck with copy paper
1) Open the paper-filling door
2) Push down the lifter deck.
3) Place a new supply of paper on the lifter deck.
4) Close the paper-filling door.

TONER OUT indicator

This indicator will flash if the toner supply in the developing assembly has run low. This indicator will not lit if the developing assembly is not loaded in the copier.

1. Reading the TONER OUT indicator

When the TONER OUT indicator flashes, one of the lights on the COLOR SELECTION indicator will flash to indicate which color of toner needs to be supplied.

Example: The supply of red toner is low.

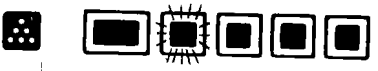


Figure 1-49

2. Refilling the black toner
1) Open the front door.
2) Pull the hopper out toward you.
3) Open the hopper lid.

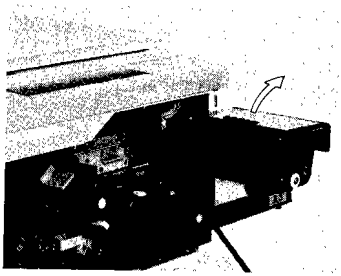


Figure 1-50

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4) Check the color of the new toner cartridge. Shake it back and forth about 10 times.
5) Place the toner cartridge one top of the opening of the hopper, and hold it firmly while slowly peeling off the cartridge seal.

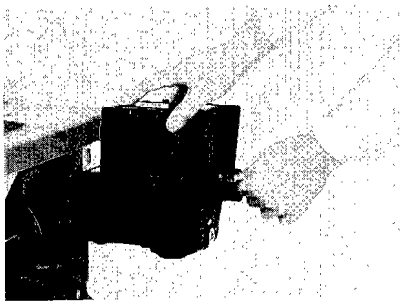

Figure 1-51

6) Lightly tap the top of the toner cartridge to shake any toner remaining in the cartridge so that it falls into the hopper.
7) Carefully remove the toner cartridge.
8) Close the hopper lid.
9) Push the hopper back into the copier.
10) Close the front door.

3. Refilling the colored toner

1) Open the front door.
2) Pull the hopper out toward you.
3) Pull the CD unit out by its handle until it stops.
4) Check the color of the toner cartridge. Shake it back and forth about ten times.
5) Place the toner cartridge on the top of the CD unit, and hold it firmly while slowly peeling off the cartridge seal.
6) Lightly tap the top of the toner cartridge to shake any toner remaining in the cartridge into the CD unit.

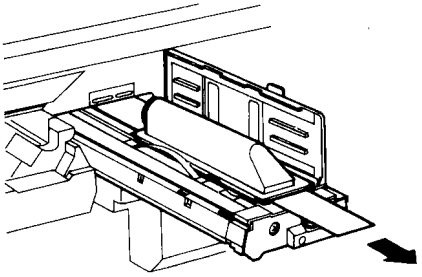

Figure 1-52

7) Carefully remove the toner cartridge.
8) Push the CD unit back into the copier.
9) Push the hopper back into the copier.
10) Close the front door.

MANUAL FEED indicator

This indicator lights if the multifeeder tray or Manual Feed lever is down. It flashes if the Manual Feed lever is down but there is no cassette in the upper cassette holder.

Raise the Manual Feed lever or the multifeeder tray before supplying paper to the upper cassette.

If the indicator is flashing, raise the Manual Feed lever or the multifeeder tray before setting the upper cassette into the copier.

CONTROL CARD/CONTROL COUNTER indicator

If the Control Counter or Control Card III is used on the copier, this indicator will flash under the following circumstances:

(1) The Control Counter is not inserted into the copier.
(2) The control card is not inserted into Control Card III.
(3) Control Card III is not inserted into the copier.
(4) The control card is inserted in Control Card III but "P" or "EE" is not displayed on the Control Card III display.

JAM LOCATION indicator

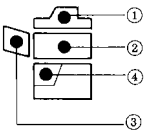

Figure 1-53

① flashes	There are still documents in the ADF, DF or RDF-I. Remove the documents.
② lights	There is a copy in the holding tray feeder area. Press the COPY START key to perform the second copying operation. The copy mode cannot be altered.
③ flashes	The sorter is not installed completely into the copier. Install it correctly.
④ lights	There is copy paper in the duplexing unit. Press the COPY START key to perform the second copying operation. The copy mode and number of copies cannot be changed.

Note: The JAM indicator is not lit.

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VI. PERIODIC CLEANING BY CUSTOMER

The following copier parts must be cleaned once a week. Explain this procedure to the users and emphasize that it is important that they perform periodic and thorough cleaning.

1) Primary, transfer, and separation corona assemblies
   Pull the assemblies out and clean the corona wires and grids, then push them back into the copier.
2) Copyboard glass
   Wipe off the glass with a damp cloth, then wipe it dry.
3) Copyboard cover
   Wipe the cover with a mild detergent solution, then wipe it dry.

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I. IMAGE FORMATION PROCESS

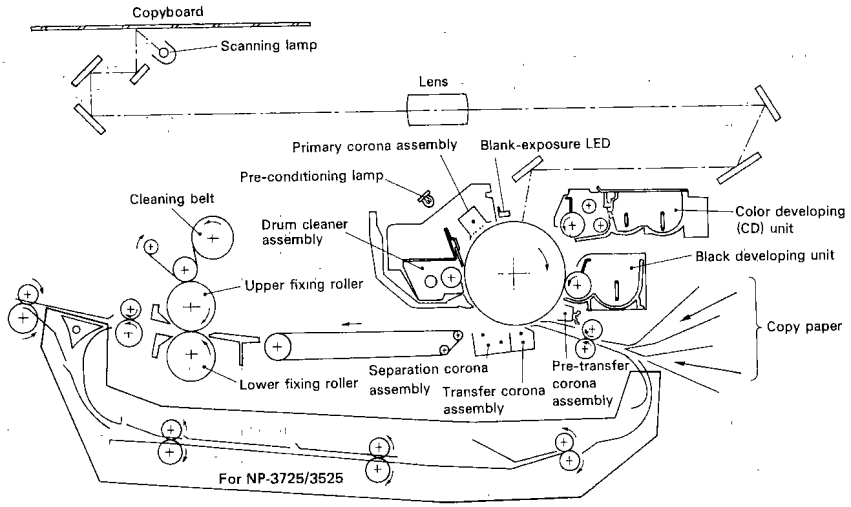

Figure 2-1

This copier uses an electrophotographic process, based on a photosensitive drum assembly with a seamless drum. Parts related to the image formation process are shown in the above diagram.

The image formation process can be divided into the 9 steps listed below. The explanations in this section correspond to these steps.

Step 1 Pre-conditioning exposure
Step 2 Primary corona (−)
Step 3 Image exposure
Step 4 Development (AC + DC bias)
Step 5 Pre-transfer corona (AC + DC bias)
Step 6 Transfer corona (−)
Step 7 Separation corona (AC + DC bias)
Step 8 Fixing
Step 9 Drum cleaning

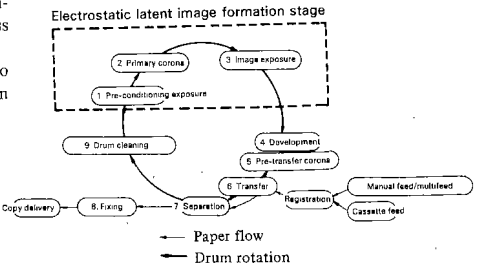

Figure 2-2

The outer surface of the photosensitive drum is a layer of organic photoconductor (OPC). The base is an aluminum conductor.

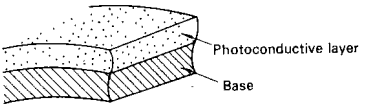

Figure 2-3

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Electrostatic latent image formation stage

This stage covers the first three steps. At the end of the stage the drum will have a pattern of negative electrical charges on its surface corresponding to the dark parts of the document image. The light parts of the document image will be represented on the drum by an absence of negative charge.

This pattern of negative charge cannot be detected by the human eye; hence the name electrostatic latent image.

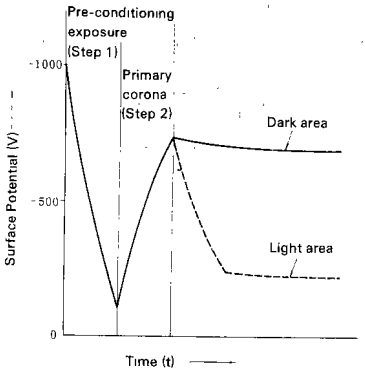

Figure 2-4

Step 1 Pre-conditioning exposure

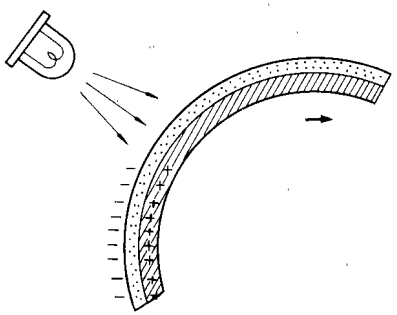

Figure 2-5

The first step in the copy making process is the exposure of the drum surface to the pre-conditioning exposure lamps to eliminate residual charges. This helps make the density of the copy even.

Step 2 Primary corona

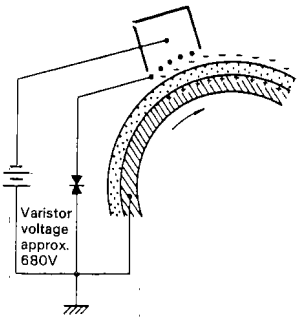

Figure 2-6

The primary corona (negative) applies a uniform layer of negative charges over the drum surface and maintains the potential.

The surface voltage of the charged drum is determined by the potential of the grid. The grid is connected to ground through a varistor; this holds the drum surface potential constant at the varistor breakdown voltage.

Step 3 Scanning exposure

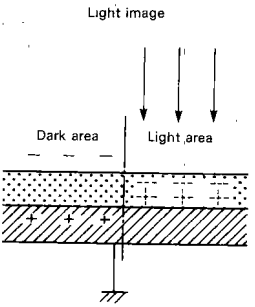

Figure 2-7

A light image of the original is projected onto the drum surface to neutralize the charges in light areas.

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Step 4 Development stage

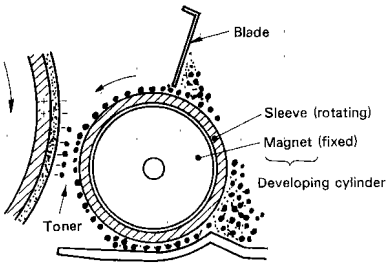

Figure 2-8

As shown in Figure 2-8, the developing assembly consists of a developing cylinder (a stationary magnet surrounded by a rotating sleeve) and a blade made of magnetic material. The black toner is single-component toner with magnetite and resin binder as the main constituents. The toner has insulating properties, and is charged to a positive potential by friction with the rotating cylinder.

The color developer is a fixed-ratio mixture of iron power and toner. The main component of the toner is resin. The toner is charged to a positive potential and the iron powder to a negative potential by friction with the rotating cylinder.

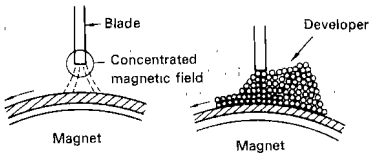

Figure 2-9

A concentrated magnetic field develops between the magnet and the edge of the blade. The field attracts the charged developer.

The developer is held virtually immobile by the magnetic field, forming a curtain along the edge of the blade. As the cylinder rotates, this "curtain" skims the toner particles on its surface to a thin, uniform layer.

An AC bias plus a negative DC bias are applied simultaneously to the developing cylinder and the blade. The resulting waveform of the developing bias therefore has a larger negative component than it does positive.

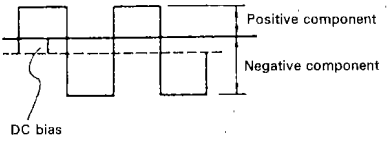

Figure 2-10

During development, toner is attracted to the drum at a rate proportional to the relative attraction of the magnet holding it to the developing cylinder and the net electric field. The net electric field is the difference between the drum surface potential and the bias on the developing cylinder. The electrostatic latent image is thus transformed to a visible one. Excess toner particles are attracted back to the cylinder from the drum during the negative excursion of the developing bias.

The AC bias (especially frequency) primarily affects the tone gradation, lower frequency will give improved gradation but cause more fogging.

The DC bias affects copy density and fogging; as DC bias increases (approaches OV), the density and fogging both increase.

Step 5 Pre-transfer corona

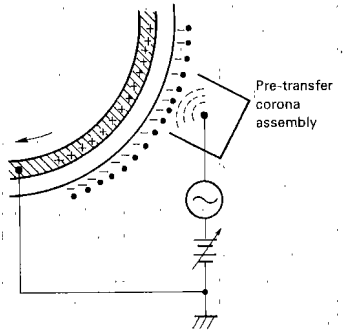

Figure 2-11

Applying an AC corona dishcarge in combination with a positive DC bias increases the charge on the toner on the drum surface and elminates the excess charge on the drum surface. As a result, the transfer efficiency is raised, and the paper can separate from the drum more easily.

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Step 6 Transfer

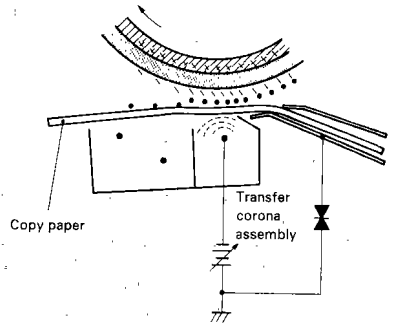

Figure 2-12

A negative corona is applied to the back of the copy paper, thus negatively charging that side of the sheet and attracting the positively charged toner from the surface of the drum to the copy paper. To prevent poor transfer or the soiling of the back of the copy paper, the transfer guides are grounded through a varistor.

Note:
Connecting the transfer guide directly to ground would neutralize the charges on the back of the copy paper to the point that transfer would be incomplete. On the other hand, not grounding it would result in toner particles adhering to the charged transfer guide, and soiling the back of the copy paper.

The copy passes through the fixing assembly after the first side is copied onto. The heat dries the paper, increasing its electrical resistance. During the second copying operation in automatic two-sided copy mode or image overlay copy mode, the dry paper would acquire a higher charge if the same transfer corona current were used, thus increasing the likelihood of incorrect separation after transfer. (The paper would tend to stick to the durm.) To prevent this, the transfer corona discharge is reduced during the second copying operation.

Step 7 Separation

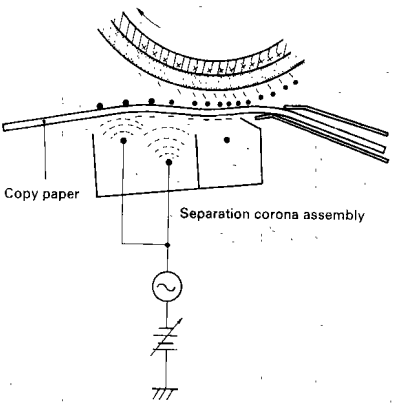

Figure 2-13

The copy paper is negatively charged by the transfer corona, causing it to be attracted to the drum by the electrostatic force. An AC corona with a DC component is applied to the back of the copy after the toner has been attracted to the paper. This corona neutralizes the electrostatic attraction between the drum and copy paper, and enables the paper to separate easily from the drum.

The copy paper comes out of the fixing assembly curled. During the second copying operation in automatic two-sided copy mode or image overlay mode, a separation corona discharge identical to that used during the first copy operation would increase the likelihood of incorrect separation.

To prevent his, the output of the separation corona discharge during the second copying operation is reduced.

Step 8 Fixing

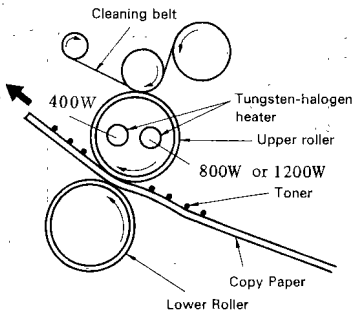

Figure 2-14

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In this step, the copy paper is pressed between two heated rollers to fix the toner image.

To prevent paper jams and toner offsetting (adhesion of toner to the roller and transfer of toner to the next copy), the upper roller is contacted by a silicone oil-impregnated cleaning belt. The take-up mechanism and the pressure roller slowly advance the cleaning belt past the upper roller, cleaning and oiling the upper roller.

Step 9 Drum cleaning

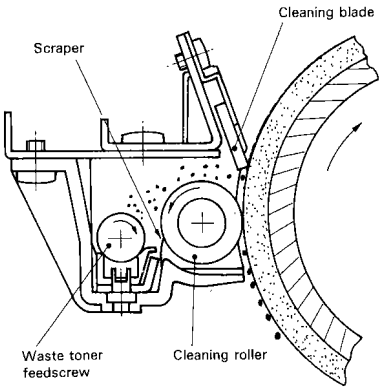

Figure 2-15

This step prepares the drum surface for the next copy by scraping any residual toner off with the cleaning blade. The toner scraped from the drum is picked up by the cleaning roller. The waste toner feedscrew then transports the toner forward for collection inside the drum.

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II. AUXILIARY PROCESSES

A. Separation Claw

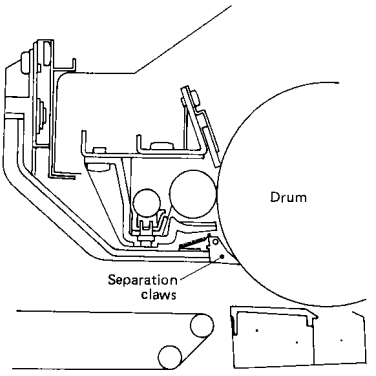

Figure 2-16

During the copying operation, the copy paper may not separate from the drum in the event of faulty pre-transfer corona or separation corona operation, or faulty copy paper transport. The copy paper will enter the cleaning unit and jam. The separation claw prevents this by forcibly peeling off any copy that fails to separate from the drum.

B. Blank Exposure Lamps (LED array)

The blank exposure lamp lights to prevent charges from accumulating on non-image areas of the drum, thereby preventing unwanted attraction of toner to the drum.

Since the reproduction ratio of the copier can be set as desired over a wide range, the non-image area also varies considerably, so an array of LEDs is used. The number of LEDs that light depend on the non-image area.

C. Ozone Filter

An ozone filter in the exhaust fan prevents the escape of ozone (generated by the coronas) from the copier. Catalytic action breaks down the ozone to oxygen.

D. Copy Delivery Static-charge Elimination

Residual charges (from the transfer step) remain on the copy paper and would cause the paper to stack unevenly. A grounded steel-wool pad in the exit of the delivery assembly eliminates these charges before delivery of the paper into the tray.

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I. BASIC OPERATION

A. Functions

This copier can be divided into four functional parts: paper pick-up and feed system, exposure system, image formation system, and control system.

■ NP-3725/3525

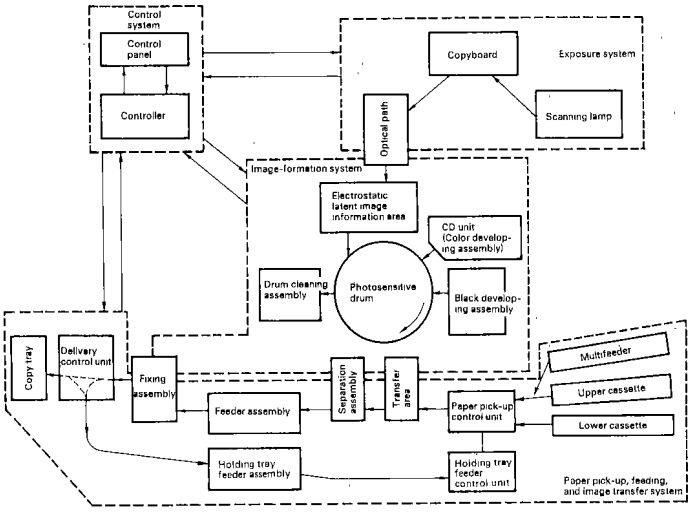

Figure 3-1

■ NP-3225/3025

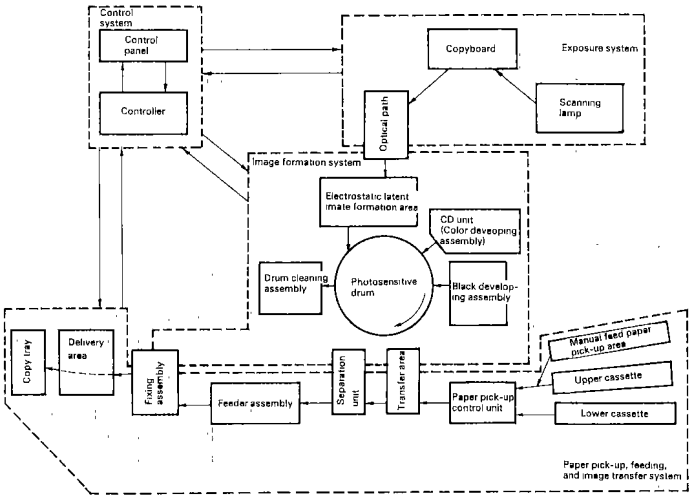

Figure 3-2

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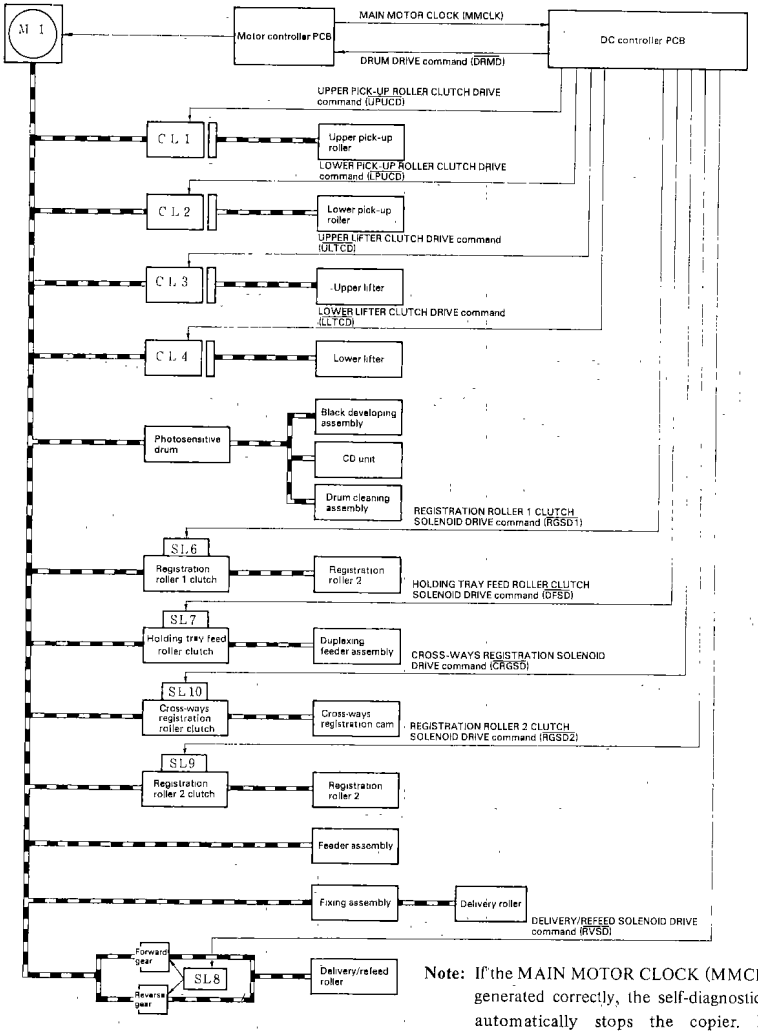
B. Main Drive System

■ NP-3725/3525

The main motor (M1) drives all moving parts except for the lens drive system, the scanner drive system and the black toner hopper unit. The main motor is controlled by the DRUM DRIVE command ($\overline{\text{DRMD}}$).

The operation of each electrical component is controlled by microprocessors on the DC controller PCB in synchronization with signals from photointerrupters.



Note: If the MAIN MOTOR CLOCK (MMCLK) is not generated correctly, the self-diagnostic function automatically stops the copier. E010 is displayed on the COPY NUMBER display on the control panel. (See page 3-40.)
The only function of this clock is to cause E010 to be displayed if the main motor is not rotating correctly. It has no timing control function.

Figure 3-3

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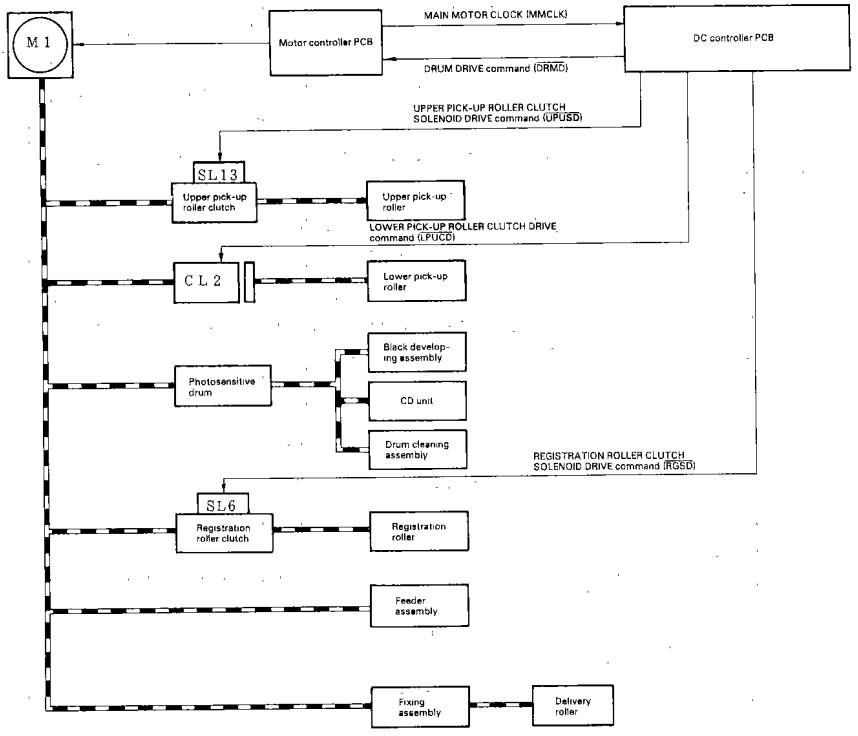
■ NP-3225/3025

The main motor (M1) drives all moving parts except for the lens drive system, the scanner drive system and the black toner hopper unit. The main motor is controlled by the DRUM DRIVE command (DRMD).

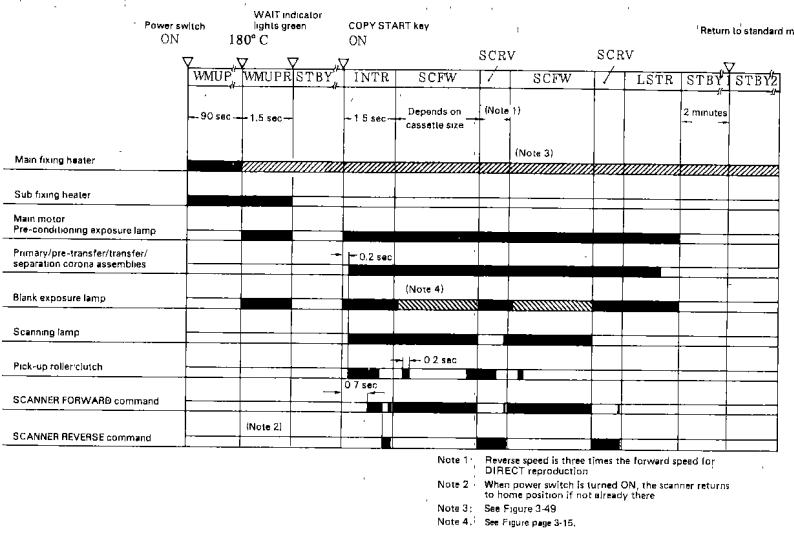
The operation of each electrical component is controlled by microprocessors on the DC controller in synchronization with signals from photointerrupters.



Note: If the MAIN MOTOR CLOCK (MMCLK) is not generated correctly, the self-diagnostic function automatically stops the copier. E010 is displayed on the COPY NUMBER display on the control panel. (See page 3-40.)
The only function of this clock is to cause E010 to be displayed if the main motor is not rotating correctly. It has no timing control function.

Figure 3-4

C. Basic Sequence (Two-Continuous Copies)



Note 1: Reverse speed is three times the forward speed for DIRECT reproduction
Note 2: When power switch is turned ON, the scanner returns to home position if not already there
Note 3: See Figure 3-49
Note 4: See Figure page 3-15.

Figure 3-5

Period		Purpose	Remarks
WMUP (WARM-UP)	From when power is switched ON until upper fixing roller reaches 180° C (approximately 90 seconds)	Providing time for fixing roller to warm up.	Warm-up time depends on initial temperature of the upper fixing roller
WMUPR (WARM-UP ROTATION)	One drum rotation (1.5 seconds) after fixing roller reaches 180°C	Cassette paper lifter is raised.	At the end of WMUPR, WAIT indicator stops flashing red and lights green
INTR (INITIAL ROTATION)	One drum rotation (1.5 seconds) after the COPY START key is pressed	Pre-conditioning (drum sensitivity is stabilized)	
		Scanner is moved approx 45 mm forward (density of the original is measured) and then back	Only in automatic density control mode
SCFW (SCANNER FORWARD)	When the scanner is moving forward, · Forward distance moved depends on cassette size and reproduction ratio · Forward speed depends on reproduction ratio	Original is illuminated by scanning lamp, and light reflected from the original travels via the mirrors and lens to the drum.	Registration signal is generated, and copy paper is sent to the transfer area
SCRV (SCANNER REVERSE)	While scanner is moving in reverse	Returns scanner to home position so next copy can be made.	Paper pick-up signal is generated, and the 2nd sheet of copy paper is fed in.
LSTR (LAST ROTATION)	After SCRV, 0.6 sec after last copy passes by fixing assembly delivery sensor	Clearing drum surface of electrostatic charges.	Last copy is completely delivered
STBY1 (STANDBY 1)	For approx 2 minutes after LSTR	Waiting for COPY START or other operating key to be pressed	
STBY2 (STANDBY 2)	From the end of STBY1 to when the COPY START key is pressed ON or the power switch is turned OFF.		Display on control panel returns to standard mode

Table 3-1

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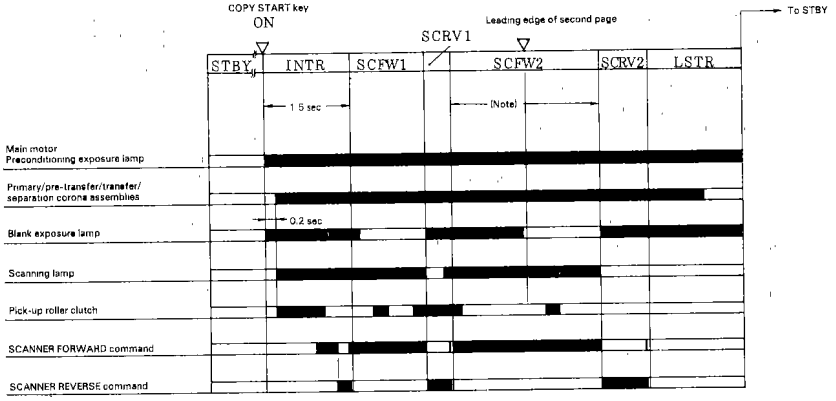
D. Basic Sequence (Two-page Separation Mode)

Pressing the TWO-PAGE SEPARATION key, then the COPY START key, starts the copying sequence shown in Figure 3-6.

When the COPY NUMBER indicator has been set to "2" or more, the preset number of copies of the first page are made, then copies of the second page are made.

When copying using AE, the copier measures only the density of the first page. The result of the measurement for the first page is used for the second page.



Note: See page 3-10.

Figure 3-6

■ SCFW1 and SCRV1 in the TWO-PAGE SEPARATION mode are the same as SCFW and SCRV in other copying sequences.

Period		Purpose	Remarks
SCFW2 (SCANNER FORWARD 2)	During second SCANNER FORWARD · Forward speed is same as for SCFW1. · Distance moved forward is approximately two times that for SCFW1.	· Scanner moves to leading edge of second page of document. · Second page of document is illuminated by scanning lamp and reflected image is projected onto photosensitive drum.	REGISTRATION signal is generated 0.3 sec after the image of the leading edge of the second page begins passing through the lens and copy paper is fed to the transfer area.
SCRV2 (SCANNER REVERSE 2)	During second SCANNER REVERSE.	Scanner returns to HOME position for next copying cycle.	Pick-up command is generated to pick up second sheet of copy paper.

Table 3-2

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II. EXPOSURE SYSTEM

A. Changing The Reproduction Ratio

The reproduction ratio across the drum is varied by changing the position of the lens. It is moved by the lens drive system. The reproduction ratio around the drum is varied by the scanner drive system.

Figure 3-7 shows how the position of the lens is varied to change the reproduction ratio across the drum.

The scanner drive system changes the reproduction ratio around the drum by varying the speed at which mirror 1 moves relative to the peripheral speed of the drum. (The mirror speed is faster than the drum rotation for REDUCTION and slower for ENLARGEMENT.)

Supplementary explanations:

1 The relative position of the mirrors is not changed to vary the reproduction ratio.

2. For DIRECT copying, the speed of the mirror is the same as the peripheral speed of the drum.

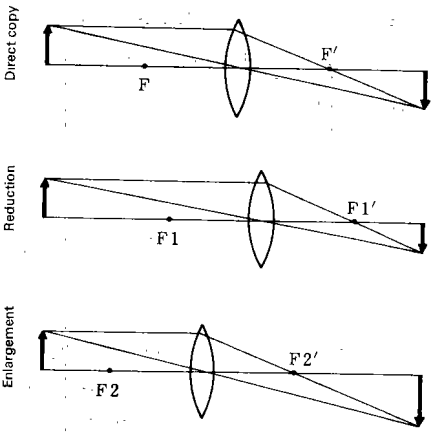

Figure 3-7

B. Lens Drive System

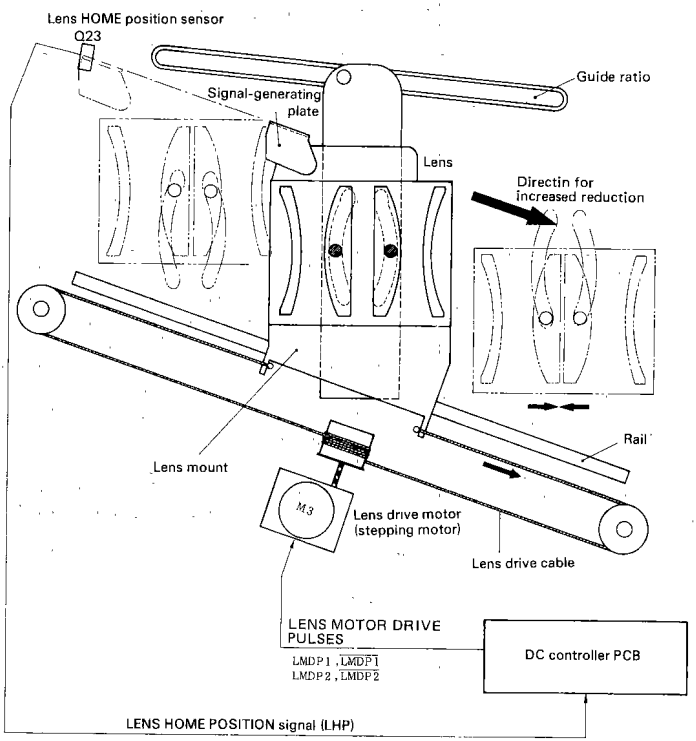

Figure 3-8

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The lens drive system is powered by the lens drive motor (M3). The direction and speed of rotation of the lens drive motor are controlled by four drive pulses output by the DC controller PCB (LMDP1, $\overline{\text{LMDP1}}$, LMDP2, $\overline{\text{LMDP2}}$).

Direction of rotation: Forward and backward

Angle of rotation: in steps of 0.6° per pulse (by the output shaft of the gear head)

When the motor rotates in the direction shown by the arrow in Figure 3-8, the lens cable is driven by the capstan. The lens mount is pulled by the cable. In Figure 3-8 the lens is moving in the direction required for REDUCTION.

When the power switch is turned ON, the motor first rotates in the reverse direction, and the signal-generating plate moves to block the HOME position sensor. This causes the motor to rotate in the forward direction. After the signal-generating plate moves away from the sensor, the motor halts after a set number of pulses have been sent from the DC controller. (The lens is now in the position for DIRECT copying)

The number of pulses required is stored in memory on the DC controller. Similarly, the DC controller sends the required number of pulses to move the lens to its other positions.

When the lens is to be positioned for a larger COPY the motor first reverses the lens past the required position, then it rotates forward to move the lens to the required position. This eliminates the problems of backlash (the lens is always stopped when the motor is rotating forward) to ensure that the lens is always positioned correctly.

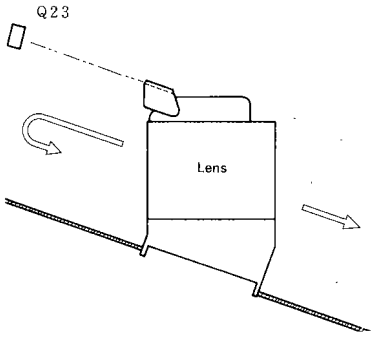

Figure 3-9

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C. Scanner Drive System

1. Outline

The scanner motor is a DC motor. By changing the polarity of the voltage applied to the motor, the direction of motor rotation is changed to drive the scanner forward or backward.

Because the reproduction ratio of the copier can be varied between 64% and 156%, the scanner forward speed varies between 109 to 266 mm/sec to correspond to the set reproduction ratio. (See Note 2)

The reverse speed of the scanner is three times the forward speed for DIRECT copying.

The distance that the scanner is moved varies according to the cassette size and the reproduction ratio. (Refer to page 3-10).

Note 1: The scanner drive system drives only the scanner.

Note 2: The scanner forward speed varies between 86 to 266 mm/sec to correspond to the set reproduction ratio. (NP-3725/3225 only)

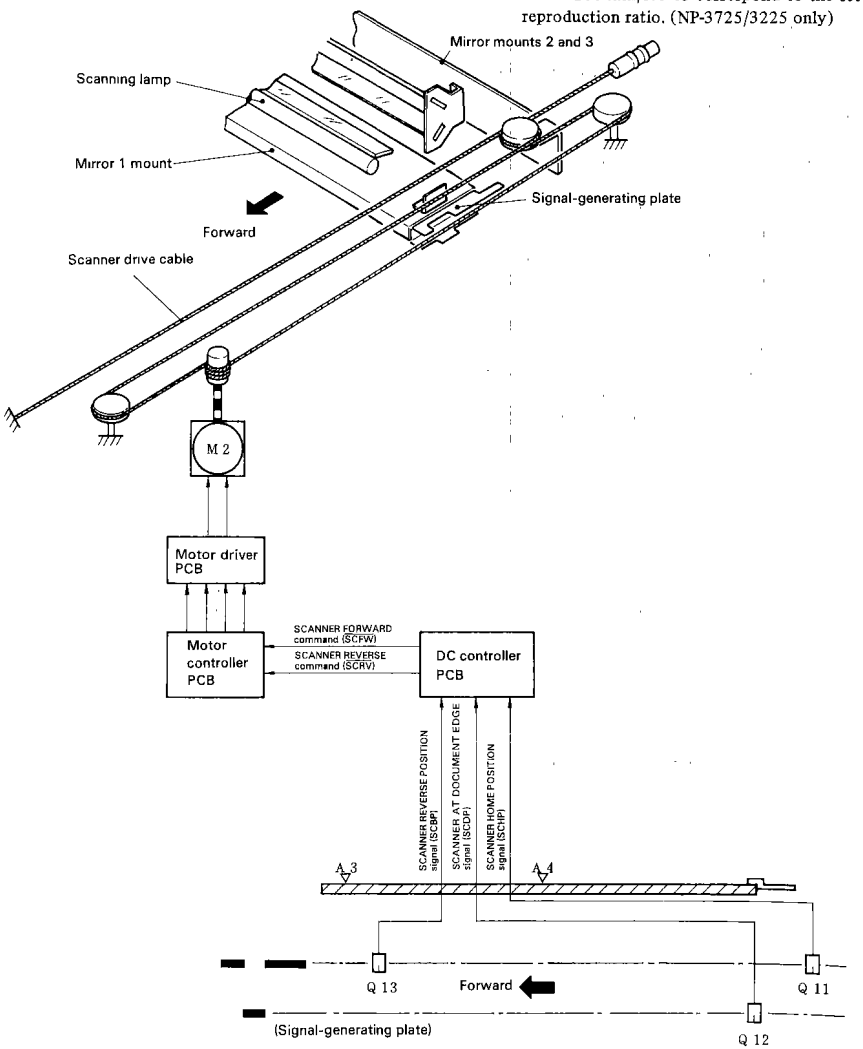

Figure 3-10

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2. Relationship between scanner sensors and signals

Scanner sensor	Signal name	Scanner		Meaning
		Forward	Reverse	
Q11	SCHP			Scanner HOME position
				· SCRV OFF · After approx. 2.5 ms, scanner brake ON
Q12	SCDP			· Scanner reverse for automatic density control · AE document density setting data read in
				· After 0.3 sec, registration roller clutch solenoid ON · Standard scanner forward distance
Q13	SCBP			Scanner reverse (See Note)

Table 3-3

3. Operating sequence of scanner

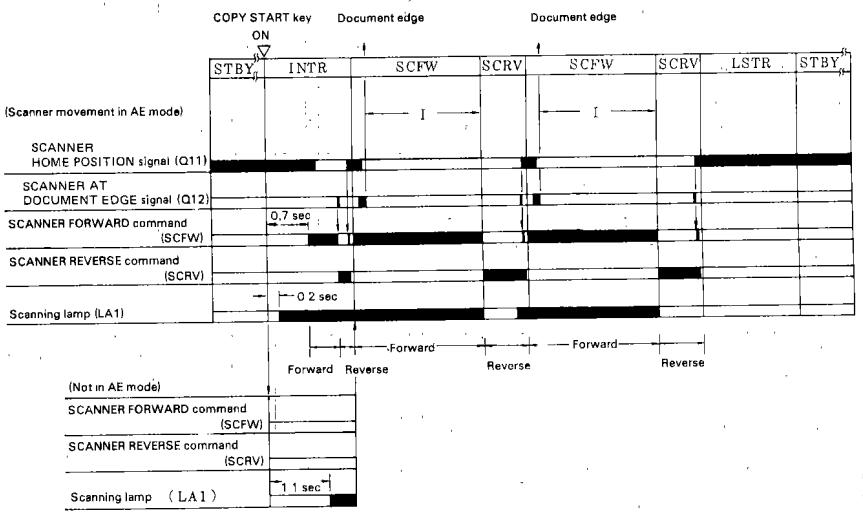

Figure 3-11 Two continuous copies

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The time that the scanner moves forward is determined by the microprocessor, using the rising edge of SCDP as a reference. The time (I) between the falling edge of SCDP and the reverse position differs depending on the cassette size. (See Table 3-4.)

Note: When making REDUCTION copies with cassette sizes A3/Ledger, B4/Legal, A4R/Letter R, the scanner may overrun the paper. To prevent this, the scanner reverse sensor controls the reverse operation, rather than the timing from the microprocessor.

Reference: Scanner forward distance (From leading edge of document to reverse position)

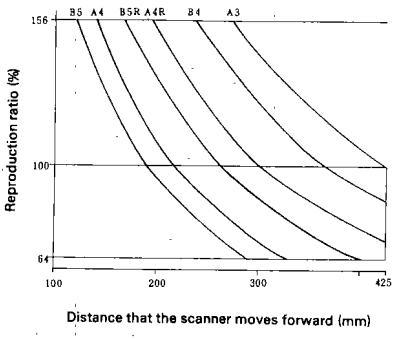

Figure 3-12

Reference: Scanner movement in two-page separation mode when making 2 continuous copies.

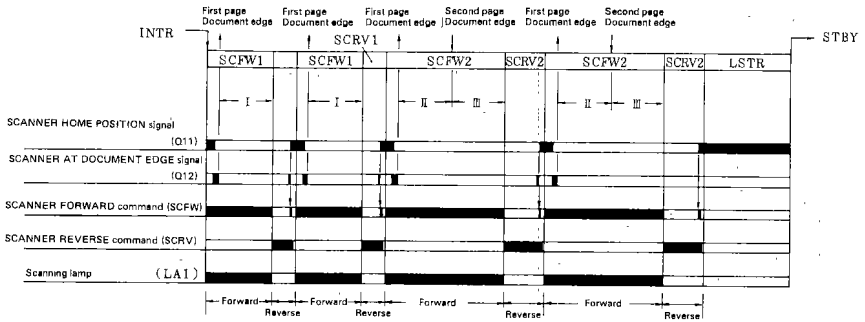

Figure 3-13

Cassette	A3	A4	B4	B5	U_L	U_S	A4R	B5R
I, III	2.50	1.26	2.17	1.10	2.20	1.38	1.78	1.54
II	2.47	1.24	2.14	1.07	2.18	1.35	1.75	1.51

Unit: sec

Cassette	Ledger	Legal	Letter	Letter R
I, III	2.57	2.12	1.30	1.67
II	1.97	1.51	0.68	1.05

Table 3-4

Periods I, II, and III in Figure 3-13 are measured by the microprocessor with respect to the leading edge of the first page (rising edge of SCDP).

I. The scanner moves forward for the period of time shown in Table 3-4.

II. The same as I, but if the distance moved is more than 210 mm (216 mm for the 115V version), the leading edge of the second page is determined to be at the position of 210 mm (216 mm).

III. The same as I, but the scanner reverses immediately after the reverse sensor generates a signal. When any cassette other than B5 is being used for ENLARGEMENT copying, periods II and III are the same as for an A4 (LTR/MINI) cassette

For ENLARGEMENT mode, II and III are equal to the times for A4 for all cassette sizes except B5.

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D. Document Size Determination

1. Outline

The auto paper selection mode and auto reproduction ratio selection mode of the copier require that the size of the original be determined by the copier before the copy is made.

There are 3 document detection circuits installed underneath the copyboard glass (Figure 3-14) to make this determination. When the copyboard cover is closed, the circuits check for the presence of a document at set locations. The DC controller then determines whether the size of the original is A3/Ledger, B4/Legal, A4/Letter, or B5.

LEDs in the document detection circuit light to illuminate the original if it is present. The light is reflected accordingly and detected by phototransistors which send a signal to the DC controller to indicate whether the document is present at each sensor location.

When the copyboard cover is closed past a certain point, microswitch MS2 goes ON to activate the document detection circuits.

2. Method of determining document size

The DC controller determines the size of the document according to the combination of the signals that were sent indicating whether the document is present at each sensor location. Table 3-5 shows the relationship between the sensors and the document size.

No.	Size of document	Document detection sensors		
		1	2	3
1	A3	ON	ON	ON
2	B4	ON	OFF	ON
3	A4	ON	ON	OFF
4	B5	ON	OFF	OFF
5	A4R	OFF	OFF	ON

ON: Document present
OFF: Document not present

Table 3-5a

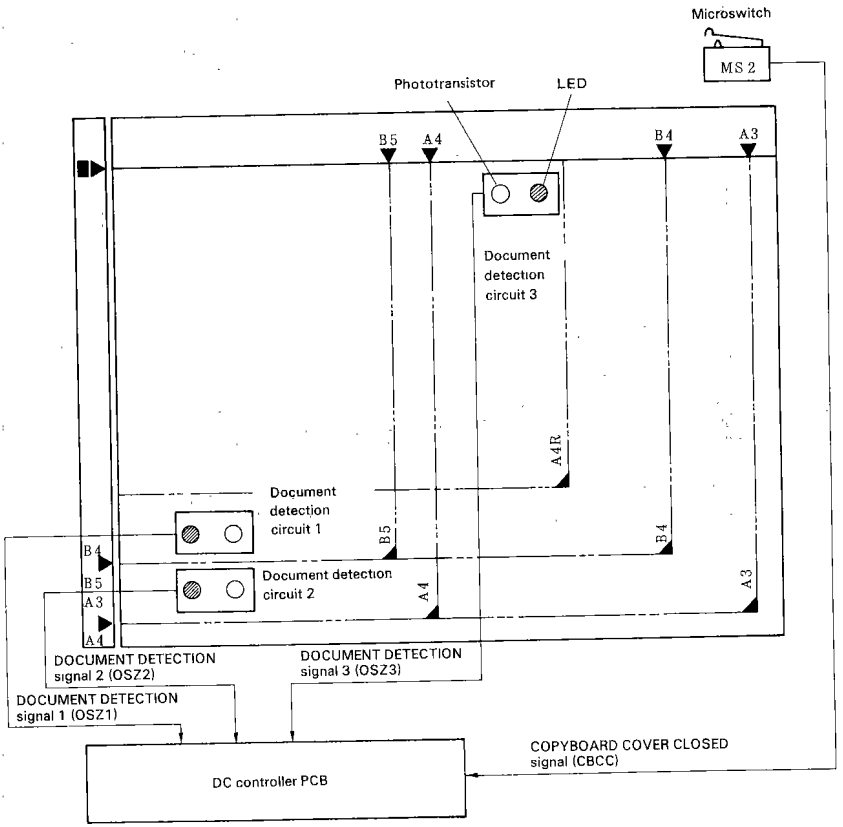

Figure 3-14a

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No.	Size of document	Document detection sensors		
		1	2	3
1	11"×17"	ON	ON	ON
2	LEGAL	OFF	ON	ON
3	LETTER	ON	OFF	OFF
4	LETTER-R	OFF	OFF	ON
5	MINI-R	OFF	OFF	OFF

ON: Document present
OFF: Document not present

Table 3-5b

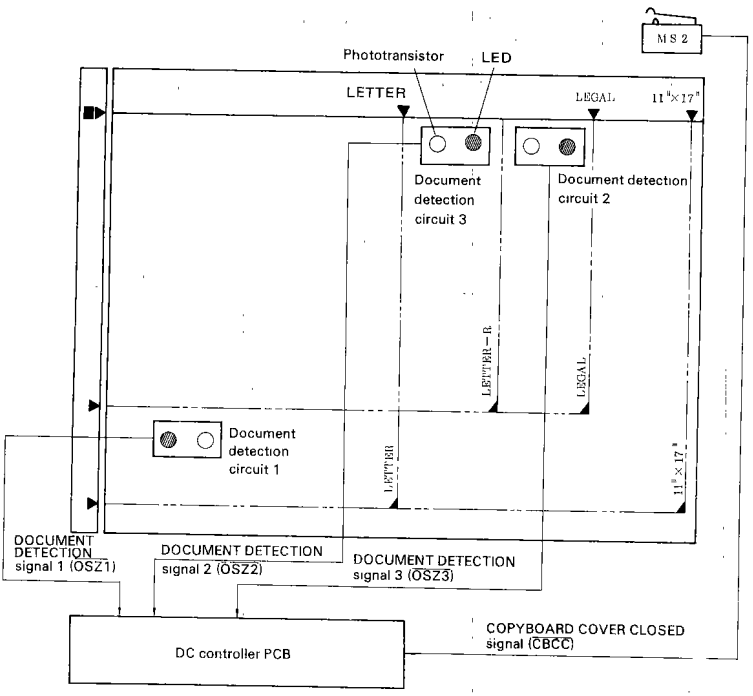

Figure 3-14b 115V machine only

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III. IMAGE-FORMATION SYSTEM

A. Outline

The basic construction of the image formation system of the copier is shown in Figure 3-15.

Photodiode sensors located under the left side of the copyboard glass measure the density of the original when the scanner is approximately 45 mm away from its HOME position (Prescanning).

The intensity of the scanning lamp is varied manually by pressing the MANUAL DENSITY CONTROL keys or automatically in AE mode to suit the density of the original. The DENSITY RECALIBRATION keys control the value of the DC component of the developing bias that is applied to the developing cylinder. The blank exposure lamp assembly is different depending on the copier, as shown in Table 3-6.

Blank exposure lamp	
NP-3725/3525	NP-3225/3025
124 LEDs	3 fuse-shaped lamps at front 39 LEDs at rear end (See Note)

Table 3-6

Note: 6 fuse-shaped lamp at front (NP-3225 only)

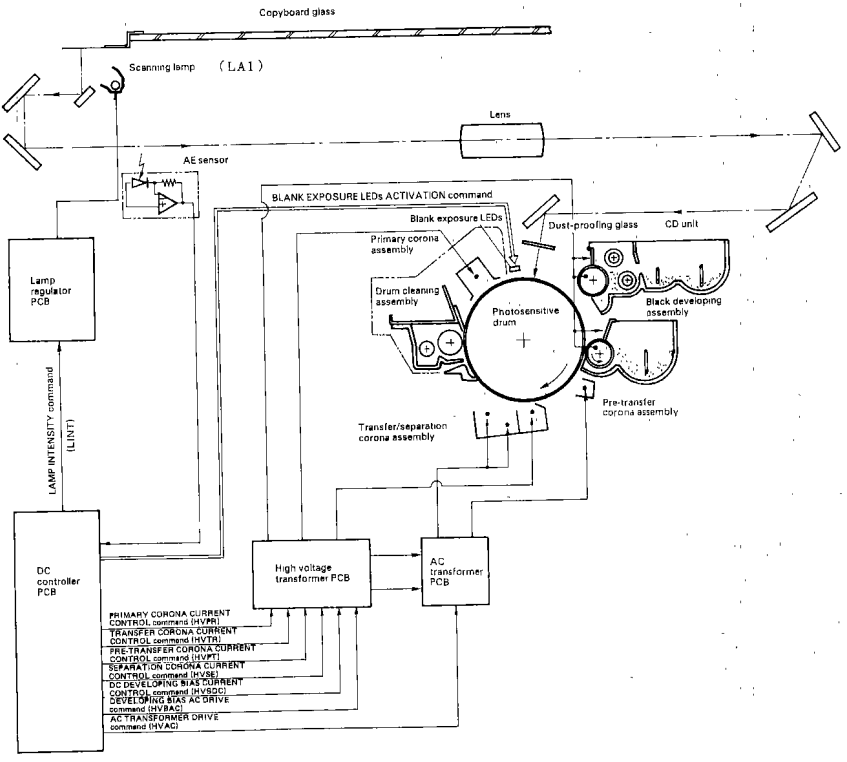

Figure 3-15

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B. Control Of The Scanning Lamp Intensity

1. Outline

The system that controls the intensity of the scanning lamp maintains constant intensity even if the line voltage fluctuates. The lamp intensity is varied in response to inputs from the MANUAL DENSITY control keys, in manual density control mode, or according to the density of the original, in automatic density control mode.

2. Automatic exposure

a. Outline

In automatic exposure mode, the copier automatically adjusts the intensity of the scanning lamp to suit the density of the original.

AE mode works well when the density of the original is fairly constant and eliminates the need to set the MANUAL DENSITY CONTROL keys. (Figure 3-16 shows the area where the density in measured for AE mode.)

b. Control system

During INITIAL ROTATION (INTR), the scanning lamp lights and the scanner moves approximately 45 mm from its HOME position and exposes the original.

At this position, the intensity of the light reflected from the original (within the density range shown in Figure 3-17) is detected by the AE sensors (photodiodes), shown in Figure 3-15. The sensor signals are then input to the DC controller.

The DC controller uses these inputs to calculate the scanning lamp intensity that best suits the density of the original, and then outputs a LAMP INTENSITY command (LINT) to the lamp regulator.

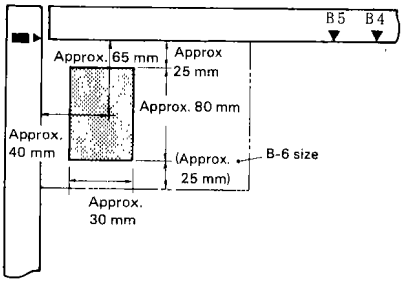

Figure 3-16

Figure 3-17 shows the relation between the intensity of the reflected light and the required exposure intensity.

This graph is based on the optimum exposure intensities required to produce copies of a test sheet and newsprint without fogging.

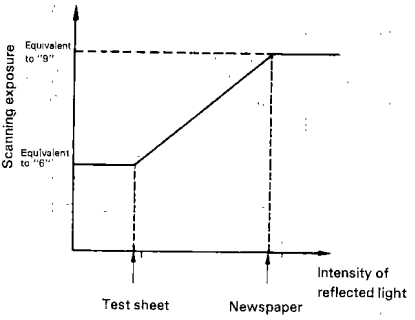

Figure 3-17

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C. Control Of Blank Exposure Lamp (LED Array)

■ NP-3725/3525

1. Outline

The blank exposure lamp consists of an LED array of 124 LEDs.

All the LEDs are lit while the drum is rotating, if an original is not being exposed.

During exposure, the LEDs light according to the reproduction ratio, the copy size, and the copy mode.

The two LEDs nearest the front end of the drum and the two nearest the rear end are always lit while the drum is rotating.

2. LED control during REDUCTION copying

During the exposure of an original for REDUCTION copying, the LEDs nearest the rear end of the drum are controlled according to the reproduction ratio; the lighting of the LEDs does not depend on the paper size. The LEDs that light correspond to the non-image area of the document.

For example, for a reduction ratio of 90%, the 15 LEDs nearest the rear end of the drum would light.

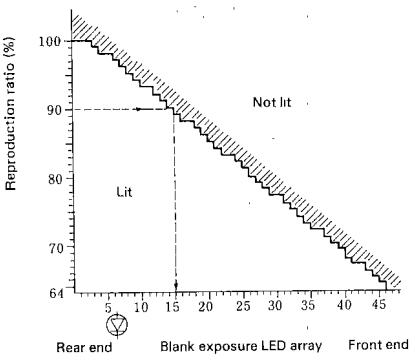

Figure 3-18

3. LED control for DIRECT copying

During exposure of the original for DIRECT copying, the LEDs nearest the rear end of the drum light as shown in Table 3-7. The LEDs that light correspond to the non-image area of the document.

Cassette size	Number of LEDs that light
A3, A4	3
U-S	5
Letter, Ledger	10
B4, B5	19
U_L	31
Legal, Letter R	35
A4R	37
B5R	49

Table 3-7 DIRECT copying
Number of LEDs that light (From rear end of drum)

4. LED control in sheet frame erasing mode

In sheet frame erasing mode, the apapropriate LEDs light to prevent toner from adhering to the drum to make a 7 mm blank strip around the perimeter of the copy.

Note: If manual feed is used with sheet frame erasing mode, LED lighting is based on A3-size paper.
For universal cassettes, sheet frame erasing mode corresponds to the largest paper size that can fit in the cassette.

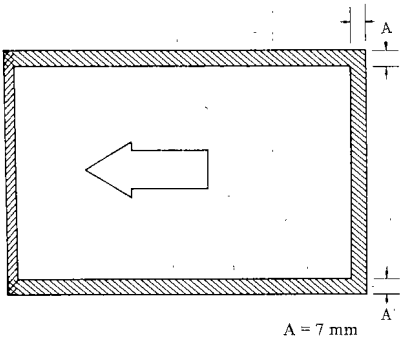

Figure 3-19

5. LED control in area setting or color conversion mode

During document exposure in color conversion mode, the LEDs are lit according to the dimensions and position of the specified area and the color conversion mode selected.

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For example, in Figure 3-20, area settings and color conversion can be used to make the copy shown in N from the original M. To print areas C, E and G in Figure M in black and the rest of the page in red, the original needs to be exposed twice in one-sheet overlay copy mode.

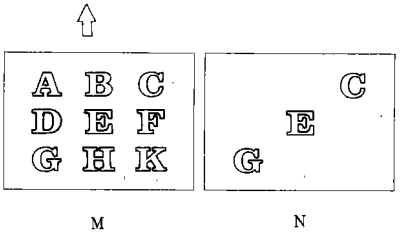
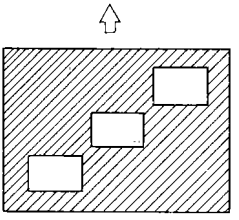


Figure 3-20

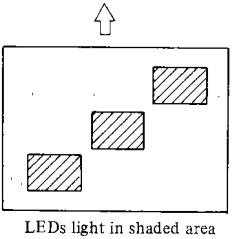


LEDs light in shaded area

Figure 3-21

During the first exposure of the original, the LEDs would light in a pattern corresponding to the shaded areas shown in Figure 3-21. The non-shaded areas would then be printed in black.

During the second exposure, the LEDs would light in a pattern corresponding to the shaded areas shown in Figure 3-22, and the non-shaded area would be printed completely red.



LEDs light in shaded area

Figure 3-22

■ NP-3225/3025

1. Outline

The blank exposure lamp consists of three fuse-shaped lamps nearest the front end of the drum and and LED array, with 39 LEDs, nearest the rear end. (See Note)

The blank exposure lamp is completely lit when the drum is rotating, except during exposure of the original.

During exposure of the original, the LEDs light according to the reproduction ratio and the copy size.

For REDUCTION copying, the LEDs are lit as shown in Figure 3-23; the lighting of the LEDs does not depend on the paper size. The LEDs that light correspond to the non-image area of the original. For example, for a reproduction ratio of 81%, the 20 LEDs nearest the rear end of the drum light, regardless of the paper size.

For DIRECT copying, the LEDs nearest the rear end of the drum light as shown in Table 3-8, regardless of the reproduction ratio. The LEDs that light correspond to the non-image area of the original.

Note: The blank exposure lamp consists of six fuse-shaped lamps nearest the front end of the drum. (NP-3225 only)

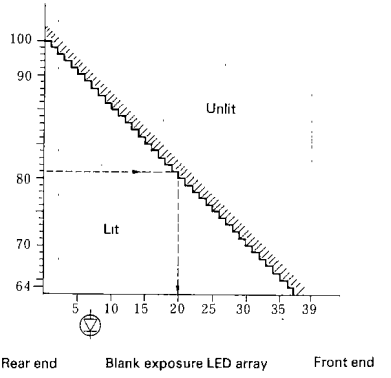


Figure 3-23

Cassette size	Number of lit LEDs
A3, A4, Ledger, Letter	1
B4, B5, Legal	14
U-L	24
A4R, Letter R	28
B5R	37
U-S	3

Table 3-8 DIRECT copying
Number of LEDs that light (From rear end)

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D. Control Of The Developing Bias

1. Outline

During copying, an AC bias and a DC bias is applied to the developing cylinder.

The AC bias is normally 1300V-pp. The DC bias varies according to the settings made in service mode and the DENSITY RECALIBRATION keys. (For details on the service mode adjustment, refer to Chapter 4.)

For example, if the black developing bias is set to −180V in the service mode, the bias can be varied up to 80V in either direction from the −180V setting using the DENSITY RECALIBRATION keys. Each shift in the LED indicator corresponds to a 10V change in the DC developing bias that is applied to the developing cylinder. During color copying, the color developing bias is (the value of the black developing bias) + (a bias compensation value).

The bias compensation value is normally −50V. It can be altered in service mode.

	Amount of variation possible using DENSITY RECALIBRATION keys	Service mode settings	
		Black developing bias	Bias compensation value
Black developing assembly	−100V – −260V	−180V	−50V
CD unit	−150V – −310V		

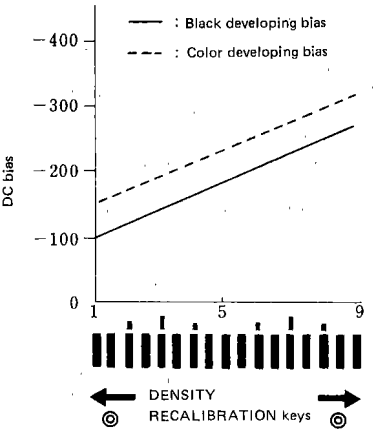

Figure 3-24

2. Developing bias control system

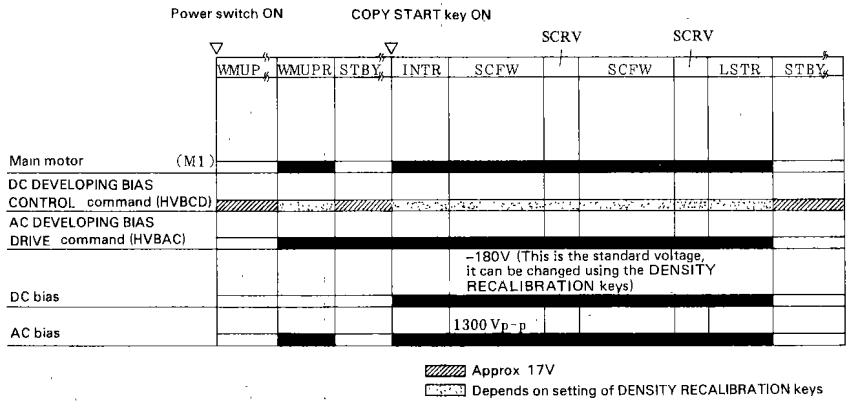

Figure 3-25

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E. Developing Assembly/Drum Cleaning Assembly

The main motor drives the cam to engage the black developing assembly when the black developing assembly release clutch solenoid (SL1) is OFF, and drives the cam to engage the CD unit when the CD unit engage clutch solenoid (SL2) is ON. Both assemblies are moved via the cams. (The timing of developing assembly movement is shown on page 3-20.)

The main motor drives the developing unit via the drum gear.

CD unit, and drum cleaning assembly.

The amount of toner in the black developing assembly is detected by the toner sensor (Q24). If the toner falls below a certain level, more toner is supplied from the hopper.

If the hopper runs out of black toner, the toner sensor (Q24) detects that there has been no black toner supply for longer than a certain time, and the TONER OUT indicator on the control panel flashes. (Refer to page 3-39 for the timing of indicator operation.)

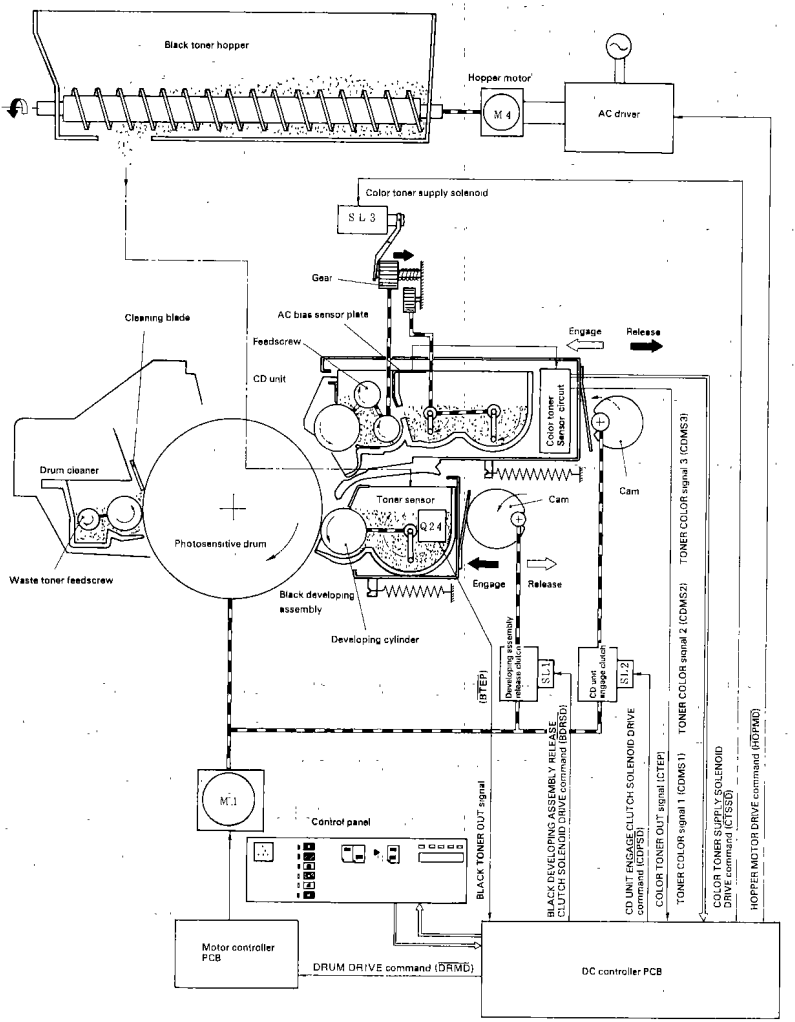

Figure 3-26

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The hopper motor (M4) supplies toner from the black toner hopper to the black developing assembly. Toner is supplied while the developing assembly is engaged and the hopper motor is rotating.

The level of color toner in the CD unit is detected by the color toner sensor circuit, and if it falls below a certain level, the color toner supply solenoid (SL3) goes ON. Toner is supplied to the developing cylinder while the CD unit is engaged and the drum is rotating. The stirring rod is driven via the drum gear to supply the toner.

If the toner supply in the color toner hopper runs out, the color toner sensor circuit senses that there has been no toner supply for a certain time, and the TONER OUT indicator on the control panel flashes. (Refer to page 3-39 for the timing of indicator operation.)

The color of toner in the CD unit is identified by the signal sent from the color toner senor circuit to the DC controller. The three toner color signals are listed in Table 3-9.

Used toner is scraped off the drum by the cleaning blade and stored inside the drum. The copier has no waste toner receptacle or waste toner level sensor.

Toner color signal	Red	Blue	Green	Brown	No CD unit
CDMS1	0	0	0	1	1
CDMS2	0	1	0	0	1
CDMS3	0	0	1	0	1

Table 3-9

Note: A piezoelectric oscillator is used as the toner sensor in the black developing assembly and it oscillates at several kHz when there is no toner. In this case, the sensor output is LOW. When there is toner, its weight stops the oscillations, and the sensor output is HIGH.

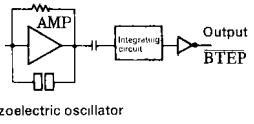

Figure 3-27

The color toner sensor circuit in the CD unit detects the voltage induced in the sensor unit by the AC bias that is applied to the developing cylinder.

When there is no toner, the induced voltage decreases and the output of the toner sensor circuit is HIGH. When there is toner, the induced voltage increases and the output of the toner sensor circuit is LOW.

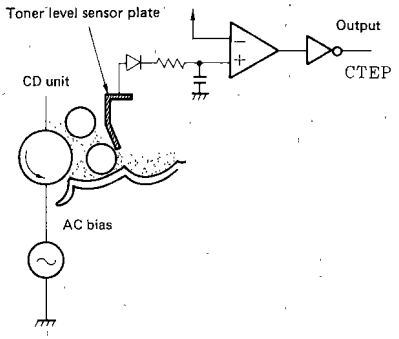

Figure 3-28

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F. Operating Sequence To Engage And Release The Developing Assemblies

1. Outline

Drive to the engage and release cams for the black developing assembly and the CD unit is controlled by SL1 and SL2 and the associated spring clutches and control rings. At the moment when the solenoids go ON or OFF, drive from of the gears shown in Figure 3-30 is transferred to one of the cams (depending on solenoid operation), and the cam makes a half turn.

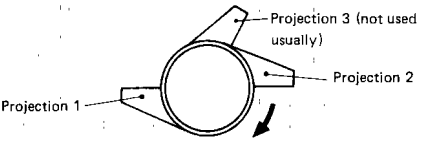

Figure 3-29

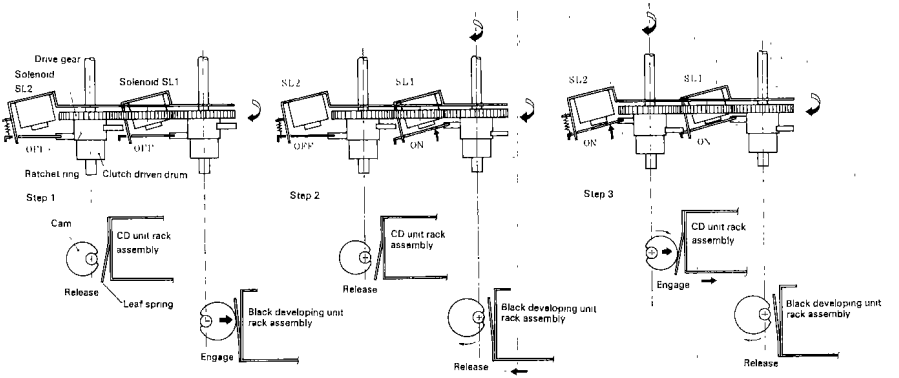

Figure 3-30

2. Black and color copies

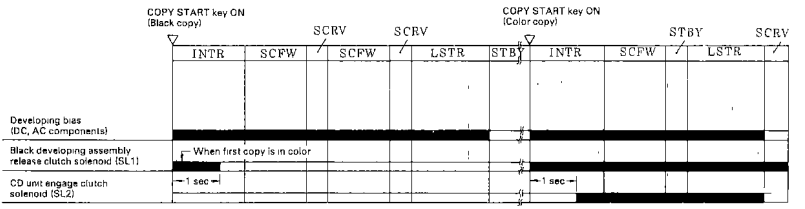

Figure 3-31

3. Black and color copies in two-page separation mode

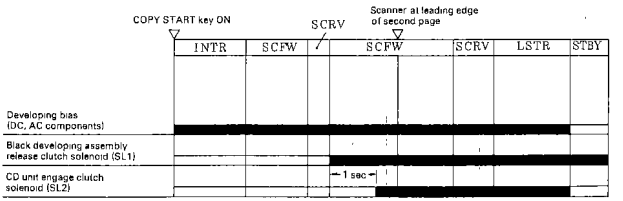

Figure 3-32

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IV. PAPER-HANDLING SYSTEM

A. Outline

■ NP-3725/3525

The presence and size of a cassette loaded in a cassette holder is detected by four switches (SW-701U-SW704U and SW701L-SW704L) located in both the lower and the upper cassette holders. A lifter plate raises the copy paper in a cassette to a position depending on detection by the photointerrupters Q20 or Q22.

The presence of paper inside a cassette is detected by photointerrupters Q19 or Q21.

When the pick-up clutch (CL1 or CL2) is ON, the pick-up rollers rotate and the paper in the cassette is fed one sheet at a time into the copier.

The registration rollers control the movement of the copy paper so that its leading edge is aligned with the leading edge of the image on the drum. The paper is

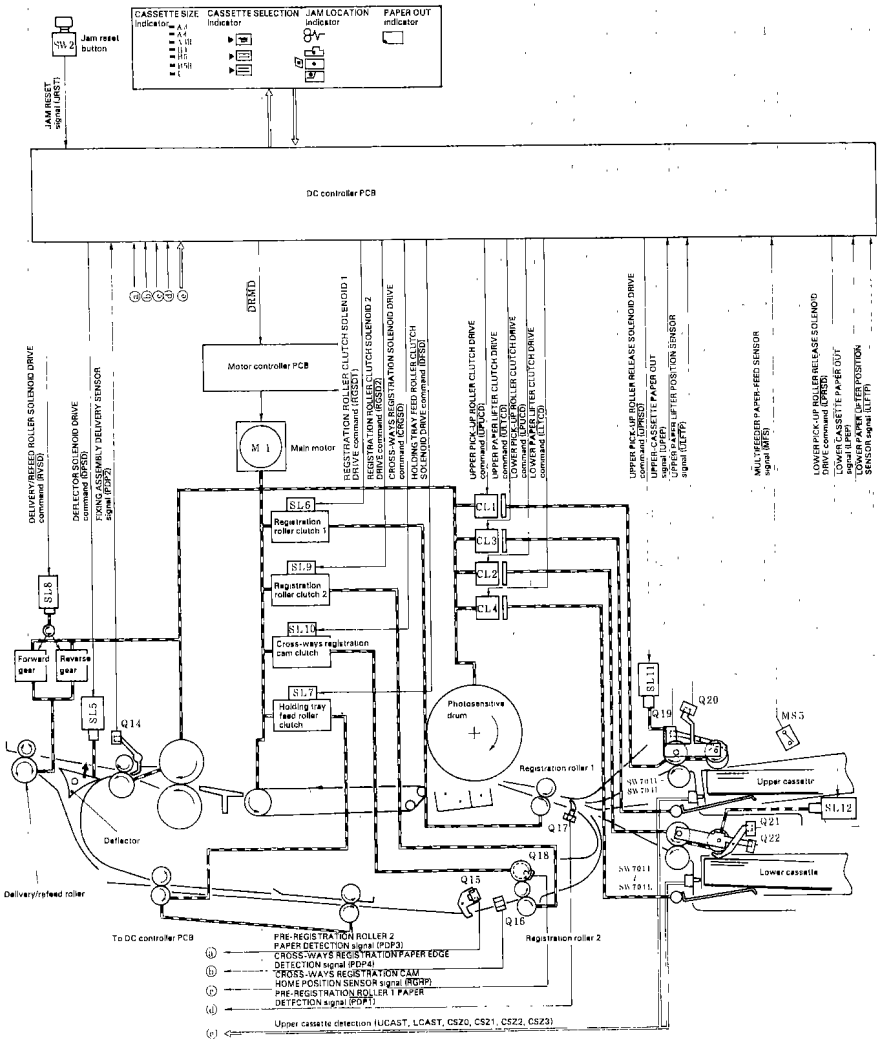

Figure 3-33

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then fed through the transfer, separation, feeder, fixing, and delivery areas and delivered to the copy tray or the holding tray.

For overlay copying, the paper deflector solenoid (SL5) is ON, and the deflector moves in the direction of the arrow. After fixing, the copy is fed to the holding tray, and then the deflector solenoid goes OFF.

For the second copy (overlay), registration rollers 1 and 2 control the copy paper movement to align the leading edge of the copy with the leading edge of the image on the drum. The copy then passes through the transfer, separation, feeder, fixing, and delivery areas and is delivered to the copy tray.

For two-sided copying, after one side has been copied onto, the copy moves past the photointerrupter (Q14) in the delivery area and stops. The delivery/refeed solenoid (SL8) goes ON and the delivery/refeed roller rotates in reverse to feed the paper to the holding tray. The copy paper is feed from the holding tray and the other side is copied onto and the paper is delivered to the copy tray.

For two-sided and overlay copying, the entire registration roller 2 unit is moved in the axial direction when the paper enters the rollers (for both copying operations). The unit is moved until the side edge of the copy paper is detected. This assures that the copy paper is in the same position both times it passes the drum. For details, refer to Page 3-31.

The photointerrupter in the fixing assembly delivery area (Q14) detects whether the copy paper has arrived or has passed by. If the copy does not arrive, or pass by, within a certain amount of time, the microprocessor determines that a paper jam has occurred, and the JAM LOCATION indicator and JAM indicator on the control panel flash.

In addition to paper feed from upper and lower cassettes, paper can be fed from a multifeeder, which is installed at the upper cassette position or from a paper deck, which is installed at the lower cassette position.

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■ NP-3225/3025

The presence and size of a cassette loaded in a cassette holder is detected by four switches (SW701U-SW704U and SW701L-SW704L) located in both the lower and the upper cassette holders.

The presence of paper inside a cassette is detected by photointerrupter Q19 (upper) or Q21 (lower).

When the upper pick-up roller clutch solenoid (SL13) goes ON or OFF, or if the lower pick-up roller clutch (CL2) is ON, the pick-up roller rotates and paper in the cassette is fed into the copier one sheet at a time.

The registration rollers control the movement of the copy paper so that its leading edge is aligned with the leading edge of the image on the drum. The paper is then fed through the transfer, separation, feeder, fixing, and delivery areas and delivered to the copy tray.

The fixing assembly delivery sensor (Q14) detects whether the copy paper has arrived, or has passed by. If the copy does not arrive, or pass by, within a certain amount of time, the microprocessor determines that a paper jam has occurred, and the JAM LOCATION indicator and JAM indicator on the control panel flash.

In addition to paper feed from the upper and lower cassettes, paper can be fed manually. The manual feed tray is installed at the upper cassette position.

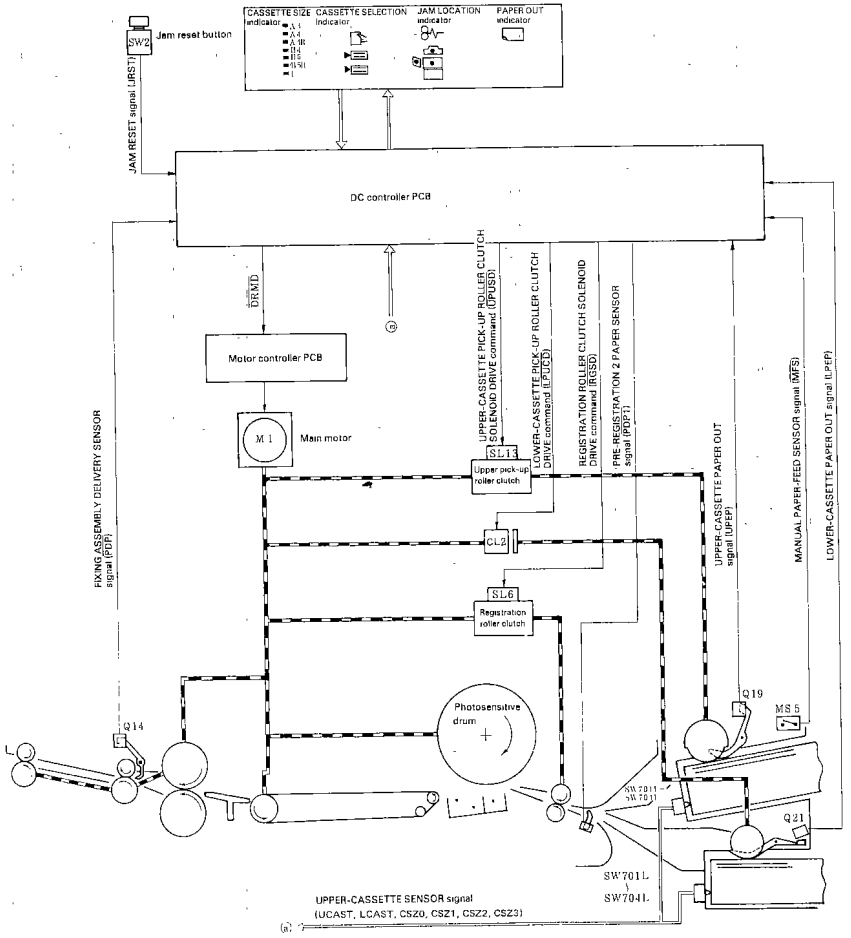
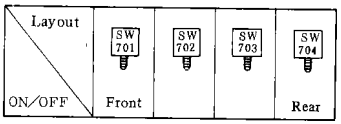


Figure 3-34

B. Cassette Size Identification

When a cassette is inserted into one of the cassette holders, switches are actuated to inform the microprocessor that a cassette has been loaded into the cassette holder and to inform the microprocessor about the size of the cassette. The microprocessor uses this information to determine the position at which scanner movement reverses, which blank exposure lamps light, and when the counter increments. The relationship between the cassette sizes and the actuation of the switches is given in Tables 3-10 and 3-11.

■ NP-3725/3525



No	Cassette	Cassette holder switch			
		SW701	SW702	SW703	SW704
1	B5	OFF	OFF	OFF	ON
2	A4	OFF	OFF	ON	ON
3	B5R	OFF	ON	OFF	OFF
4	B4	OFF	ON	OFF	ON
5	A4R	OFF	ON	ON	OFF
6	A3	OFF	ON	ON	ON
7	U-S	ON	OFF	OFF	OFF
8	U-L	ON	OFF	ON	OFF
9	Letter	ON	OFF	ON	ON
10	Mini R	ON	ON	OFF	OFF
11	Legal	ON	ON	OFF	ON
12	Letter R	ON	ON	ON	OFF
13	11' X 17'	ON	ON	ON	ON
14	Multifeeder	—	—	—	—
15	No cassette	OFF	OFF	OFF	OFF

Table 3-10

■ NP-3225/3025

Layout / ON/OFF	SW 704 Front	SW 703	SW 702	SW 701 Rear
OFF	Large cassette	A-size cassette	Standard cassette	No cassette
ON	Small cassette	B-size cassette	Universal cassette	Cassette installed

No.	Cassette	Cassette holder switch			
		SW701	SW702	SW703	SW704
1	A3/11' X 17'	OFF	OFF	OFF	ON
2	A4/Letter	ON	OFF	OFF	ON
3	B4/Legal	OFF	ON	OFF	ON
4	B5/Mini	ON	ON	OFF	ON
5	U_L	OFF	OFF	ON	ON
6	U_S	ON	OFF	ON	ON
7	A4R/Letter R	OFF	ON	ON	ON
8	B5R	ON	ON	ON	ON
9	Manual copy mode	—	—	—	—
10	No cassette	OFF	OFF	OFF	OFF

Table 3-11

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C. Cassette Feed

■ NP-3725/3525

Both the upper and lower cassette pick-up units use an electromagnetic clutch (CL1/CL2).

If there is no paper at the pick-up position in the cassette when the COPY START key is pressed, the paper lifter clutch (CL3/CL4) is turned ON and the lifter rises.

At this point, the photointerrupter (Q19/Q21) detects whether there is paper in the cassette. The position of the lifter is detected by a second photointerrupter (Q20/Q22), and 0.2 seconds later the lifter stops moving.

Simultaneously, the pick-up roller clutch (CL1/CL2) goes ON for approximately 0.9 seconds, and the paper is fed to the registration rollers.

The registration rollers are not rotating at this time, so the paper arches when it comes into contact with the registration rollers. If the lifter rises but the photointerrupter (Q19/Q21) does not detect any paper, the DC controller determines that there is no paper in the cassette and the PAPER OUT indicator lights.

0.3 seconds after the falling edge of the SCANNER AT DOCUMENT EDGE signal, the pick-up roller clutch goes ON for 0.2 seconds. Simultaneously, registration roller 1 clutch solenoid (SL6) goes ON and registration roller 1 begins to rotate.

The pick-up roller release solenoid (SL11/SL12) also goes ON at this time, and the pick-up roller unit rises and releases the paper so that the paper can be fed by the registration roller.

As copy paper is used, a point is reached when the lifter position can no longer be detected, so the PAPER LIFTER POSITION signal goes LOW, and the paper lifter clutch goes ON. The lifter rises and 0.2 seconds after its position is detected, the lifter clutch goes OFF.

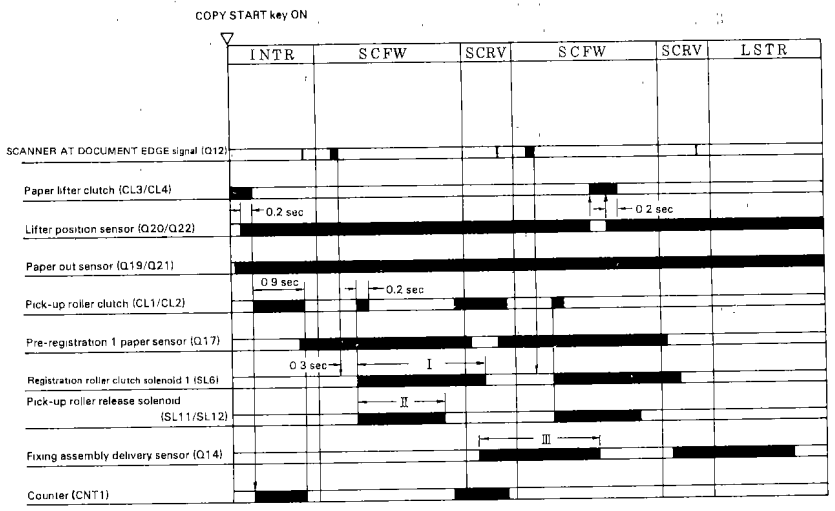


Figure 3-35

Note: For the second copy in two-page separation mode, registration roller clutch solenoid 1 goes ON at the times shown in Figure 3-13 and Table 3-4, under "Second page document edge".

Cassette	A3	A4	B4	B5	U_L	U_S	A4R	B5R
I	2.59	1.35	2.26	1.19	2.29	1.47	1.86	1.63
II	1.88	0.65	1.55	0.48	1.59	0.76	1.16	0.92
III	2.47	1.24	2.14	1.07	2.18	1.35	1.75	1.51

(Unit: sec)

Table 3-12

■ NP-3225/3025

The distance from the pick-up rollers to the registration rollers is longer for the upper cassette than for the lower cassette. For this reason, the operating sequences are different.

The upper pick-up roller is controlled by the spring clutch, the control ring, and the solenoid (SL13). At the moment when the solenoid goes ON or off, drive from the gear shown in Figure 3-37 is transferred to the pick-up rollers. The upper cassette pick-up roller makes 2 revolutions.

Drive to the lower pick-up roller is controlled by a magnetic clutch (CL2), and the roller is driven by the main motor when the clutch is ON.

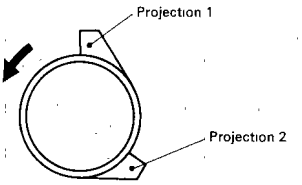


Figure 3-36 Control ring

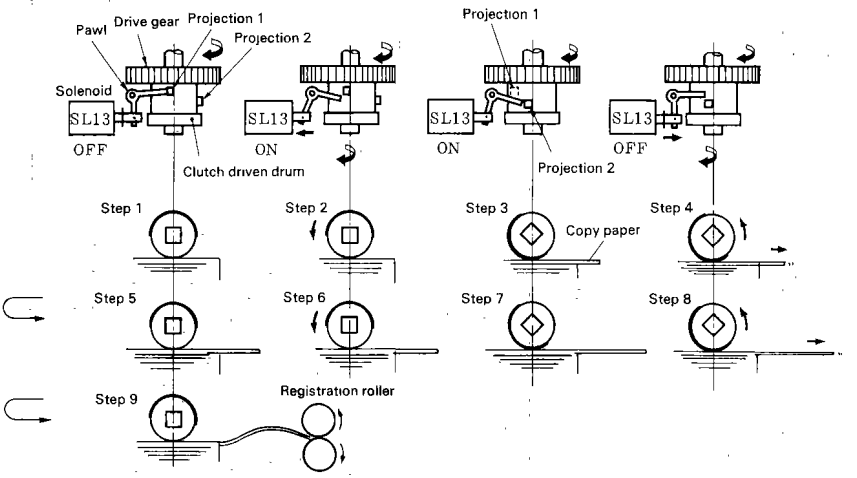
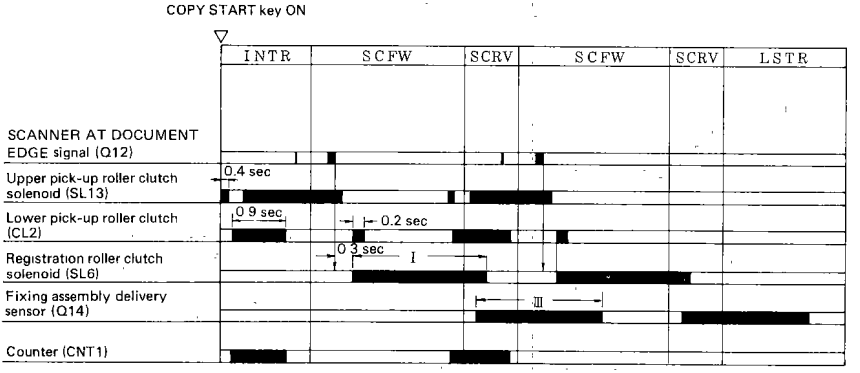


Figure 3-37 Upper cassette pick-up roller



Refer to Table 3-12 for I and III.

Figure 3-38

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D. Control Of Registration Roller Clutch

The registration clutch controls the registration rollers so that the leading edge of the paper is correctly aligned with the leading edge of the image on the drum.

Unless the copier is in sheet frame erasing mode, the registration roller clutch is controlled to make the leading edge of the copy paper match the leading edge of the image on the drum.

In binding margin mode, the copier is controlled as shown in Figure 3-39 in order to create a binding margin on the copy paper.

Mode selected		Copy paper timing	Shift amount (mm)	Alignment of images on copy paper	Remarks
One-sided original → One-sided copy		B	5		
One-sided originals → Two-sided copy	First side copy	A	5		
	Second side copy	B	5		
Two-page separation (One-sided copies)	First side copy (Left side)	B	5		
	Second side copy (Right side)	B	5		
Two-page separation → Two-sided copy	First side copy (Left side)	A	5		
	Second side copy (Right side)	B	5		
One-sided originals → Overlay copy	First side copy	B	5		
	Second side copy	B	5		
Two-page separation → Overlay copy	First side copy (Left side)	B	5		
	Second side copy (Right side)	B	5		

Copy paper | Image area of the first side copy | Image area of the second side copy | D area: erased by blank exposure lamp

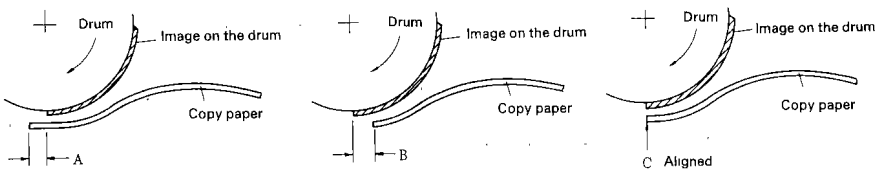

Figure 3-39

E. Multifeeder Paper Feed

■ NP-3725/3525

1. Outline

When the multifeeder tray is opened, microswitch MS5, shown in Figure 3-40, is actuated. The copier enters multifeeder mode and the multifeeder indicator on the control panel lights. (The upper lifter position detection lever unblocks Q20, and the upper copy paper detection lever unblocks Q19.)

After copy paper is placed in the multifeeder tray and the COPY START key is pressed, the multifeeder paper supply plate clutch (CL5) goes ON, the multifeeder paper supply plate rises, and the lever blocks Q19. The pick-up roller then feeds the copy paper into the copier.

Scanner forward distance is the same as when copy paper that is 432 mm long is used, regardless of the actual size of the paper that is used.

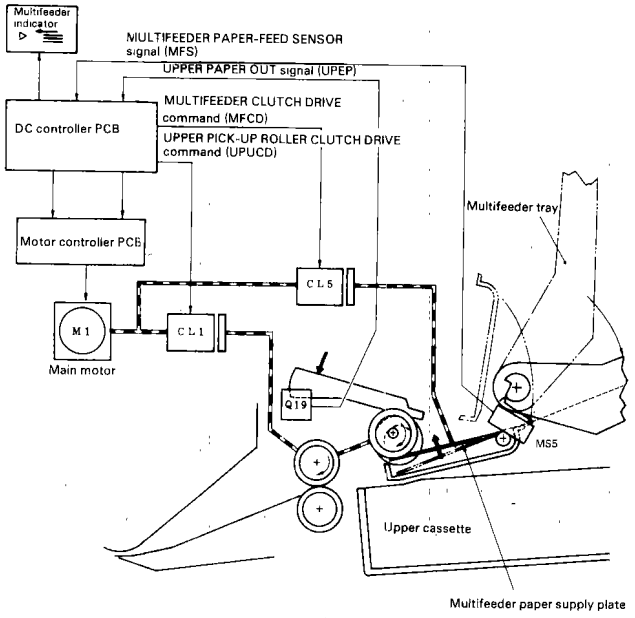

Figure 3-40

2. Sequence of operations for multifeeder paper feed

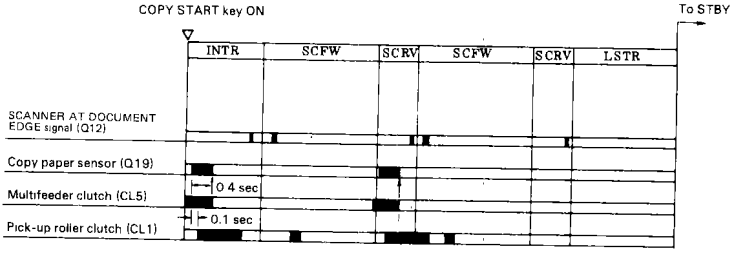

Figure 3-41

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F. Sequence Of Operations For Paper Feed

1. Sequence of operations for making one overlay copy

■ NP-3725/3525 only

a. Outline

For the first copy, the deflector solenoid (SL5) goes ON 0.3 seconds after the SCANNER AT DOCUMENT EDGE signal is sent, and the deflector rises.

After the copy paper passes the fixing rollers, it is sent to registration roller 2. The roller is not moving at this time, so the paper arches.

Registration roller 2 then rotates to send the copy paper to registration roller 1.

Registration roller 1 rotates 0.3 seconds after the SCANNER AT DOCUMENT EDGE signal is sent and the overlay copy is made. The deflector is down at this time, so the copy is delivered to the copy tray after leaving the fixing assembly.

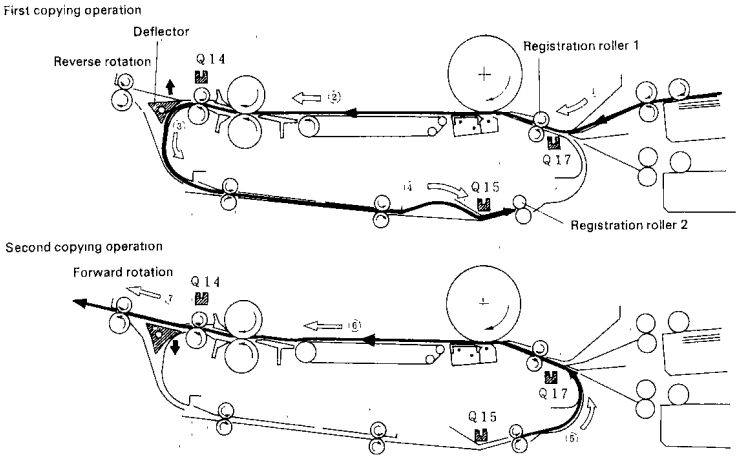

Figure 3-42

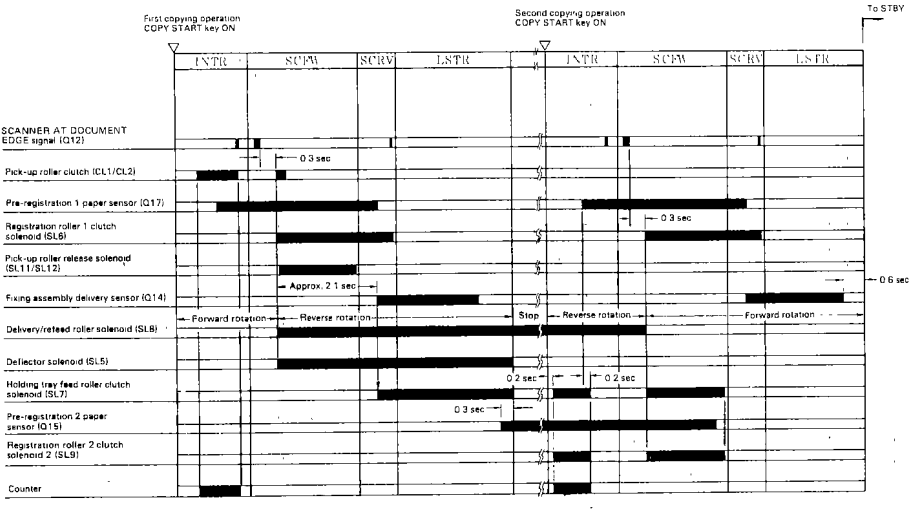

Figure 3-43

2. Sequence of operations for one two-sided copy

■ For NP-3725/3525 only

a. Outline

For the first copying operation, the delivery/refeeder solenoid (SL8) goes ON 0.3 seconds after the copy passes the fixing assembly delivery sensor (Q14).

This causes the delivery/refeeder rollers to rotate in the direction for refeed.

The copy paper is then feed to registration roller 2 via the holding tray.

The second copying operation is the same as for the second copying operation for overlay copying.

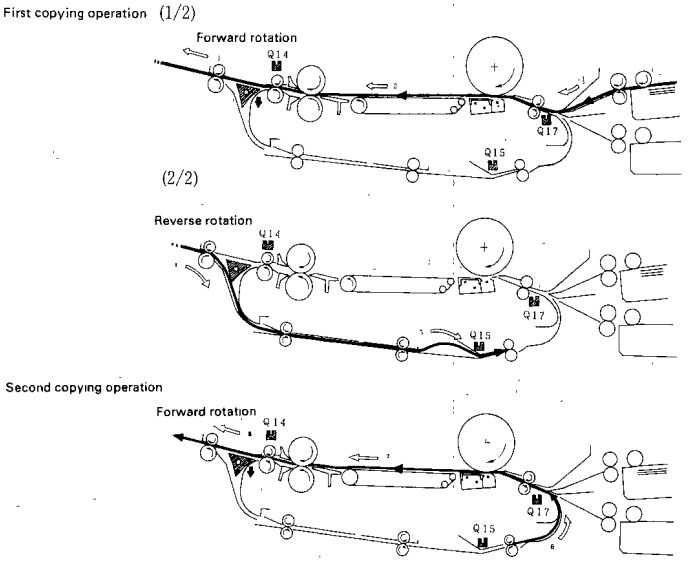

Figure 3-44

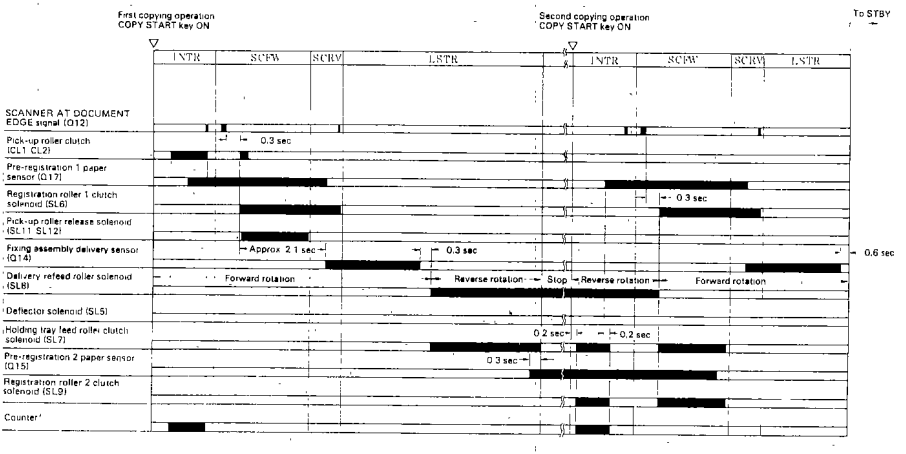

Figure 3-45

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G. Sequence Of Operation For Cross-ways Registration

■ NP-3725/3525 only

1. Outline

To reduce side-to-side play which would result in misalignment of the images for overlay and two-sided copying, the registration roller 2 unit is moved sideways (when paper is between rollers for second copying operation) until Q16 detects the side edge of the copy paper. This ensures that the side edge of the copy paper will be positioned at the same place on the drum for both copying operations.

When the cross-ways registration clutch solenoid (SL9) goes ON, the clutch engages so that the main motor drives the cross-ways registration cam in the direction of the arrow. This moves the registration roller 2 unit in the cross-ways (axial) direction.

The home position of the cross-ways registration cam is determined by the cross-ways registration cam home position sensor (Q18).

The side edge of the copy paper is detected by the paper side edge sensor (Q16).

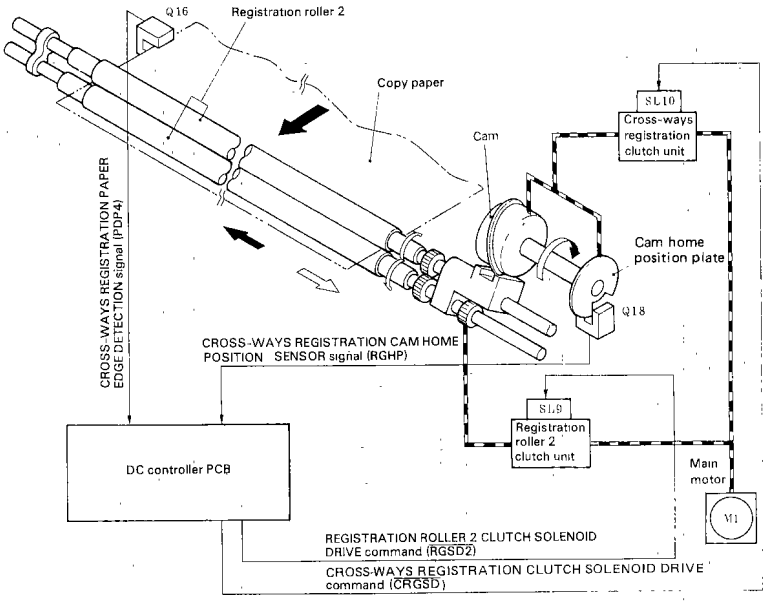

Figure 3-46

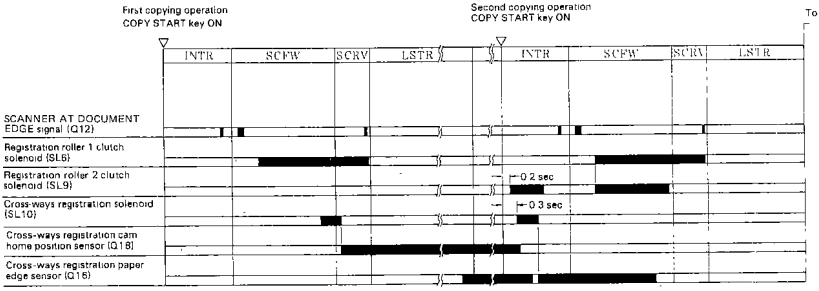

Figure 3-47

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H. Outline of Duplexing Unit (option)

■ NP-3725/3525 only

The duplexing unit motor (M1) drives moving parts such as the duplexing unit's paper pick-up roller and feeder roller as shown in Figure 3-47a.

The cross-alignment motor (M2) drives the cross-alignment guide outwards or inwards by either forward or reverse rotation to align the copy paper laterally.

When the paper end plate solenoid (HTSL1-HTSL4) is operated by the DC controller of the main unit in accordance with the size of the copy paper, the paper end plate is raised in the direction of the arrow. This aligns the trailing edges of the paper fed into the duplexing unit. Paper is detected by photointerrupters installed in the feeder area (P11) and delivery area (P12), and by a reflective sensor (P13) in the holding tray area.

The duplexing unit driver PCB controls all of the motors and solenoids and is commanded by the microprocessor on the DC controller of the copier.

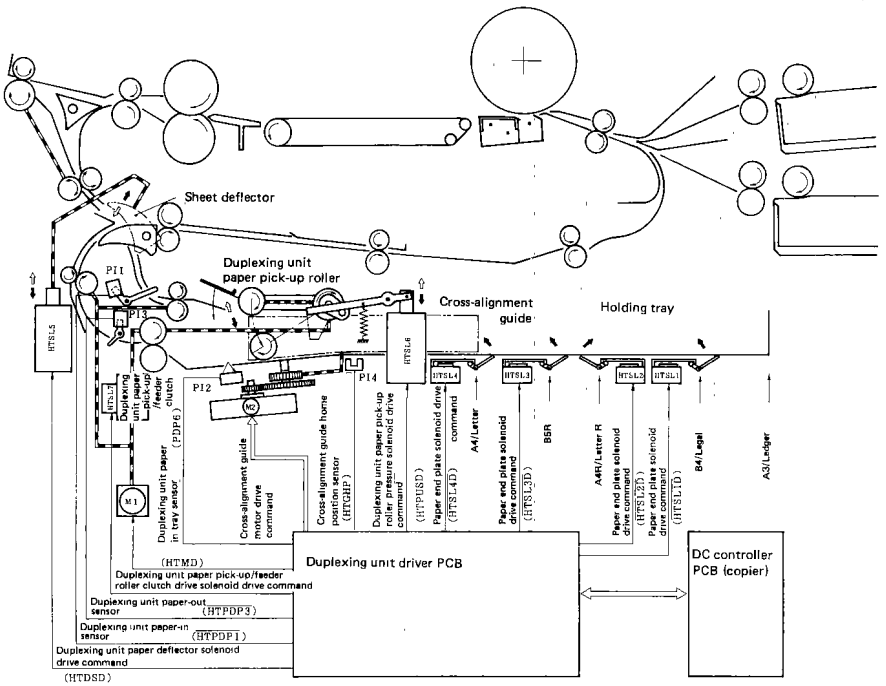

Figure 3-47a

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I. Sequence of operations for overlay copying in the duplexing unit (first copying operation)

■ NP-3725/3525 only

When the copy start key is switched on, the motor (M1) of the duplexing unit operates and the paper deflector solenoid (HTSL5) is actuated causing the deflector to rise.

After the copy paper passes the paper delivery sensor (Q14) in the copier, the reverse rotation drive solenoid in the copier is actuated and the delivery/refeed roller rotates in the reverse direction. This causes the copy paper to be delivered back to the duplexing unit in a switchback operation.

The second copying operation is described on page 3-31d.

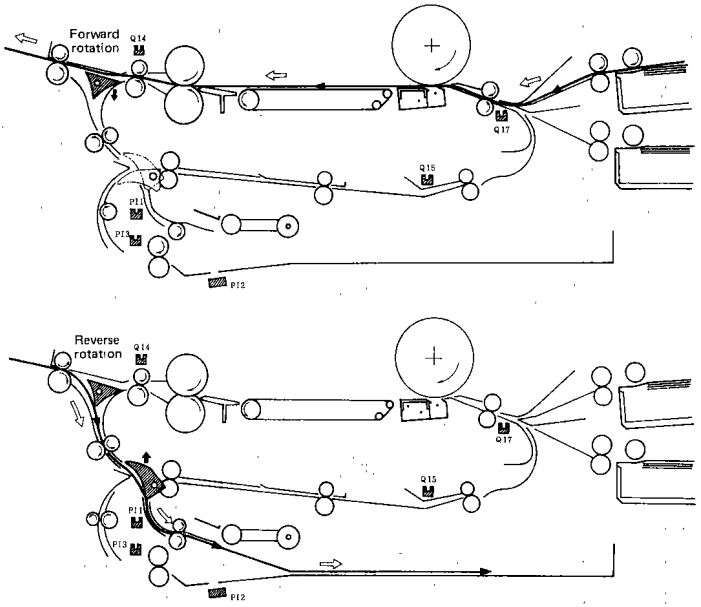

Figure 3-47b

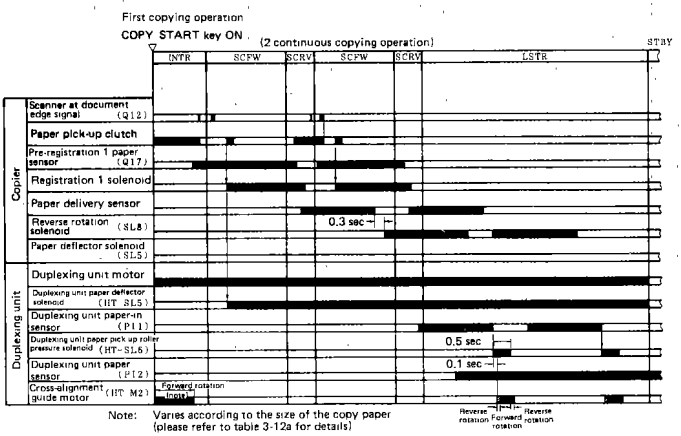

Figure 3-47c

J. Operating Sequence for two-sided copying of the duplexing unit (first copying operation)

■ NP-3725/3525 only

When the copy start key is switched on, the duplexing unit motor (M1) operates and the paper deflector solenoid (HTSL5) is actuated causing the deflector in the duplexing unit to rise.

The deflector solenoid (SL5) of the copier goes on 0.3 seconds after the scanner at document edge signal is sent, and the deflector rises.

After the copy paper passes the fixing rollers, it is sent to the duplexing unit.

The second copying operation is described on page 3-31d.

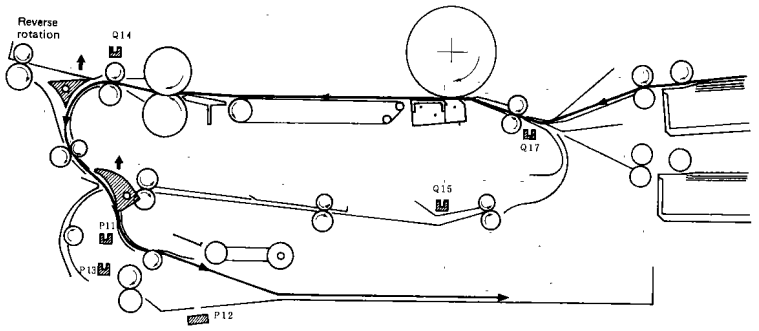

Figure 3-47d

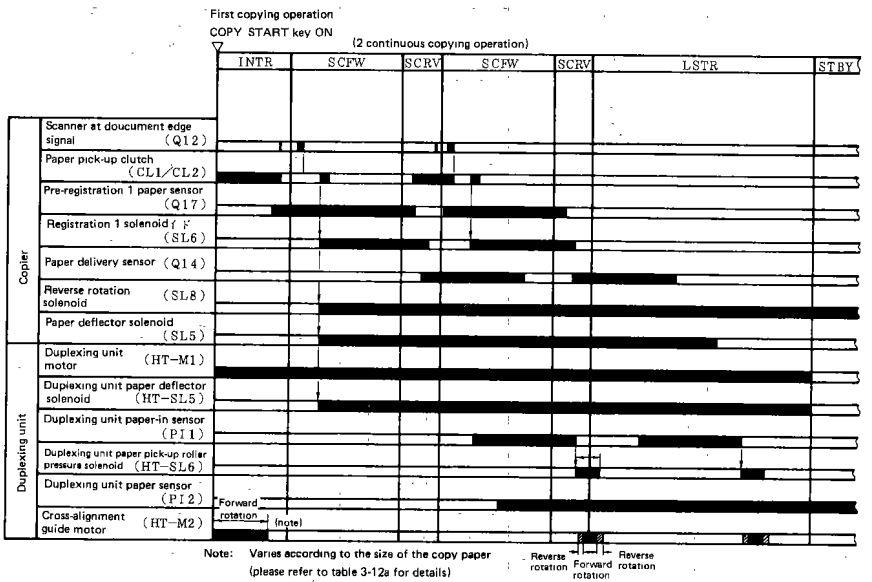

Figure 3-47e

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K. Sequence of operations for two-sided/overlay copying in the duplexing unit (second copying operation)

When the copy start-key is switched on, the duplexing motor (HTM1) operates and the paper pick-up roller pressure solenoid (HTSL6) of the duplexing unit is actuated causing the paper pick-up roller to be lowered in the direction of the arrow.

The paper pick-up/feeder roller clutch drive solenoid (HTSL7) is then actuated and the pick-up roller feeds the copy paper into the copier.

During this operation the paper deflector of the duplexing unit is switched off and the copy paper is fed to the registration roller 2. The paper arches and the registration roller 2 rotates.

The registration 1 roller starts to rotate 0.3 seconds after the scanner at document edge signal is sent. After the copy paper passes the fixing rollers, it is sent to the copy tray.

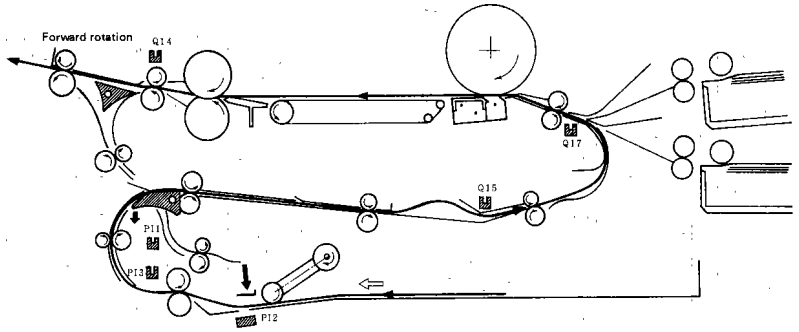

Figure 3-47f

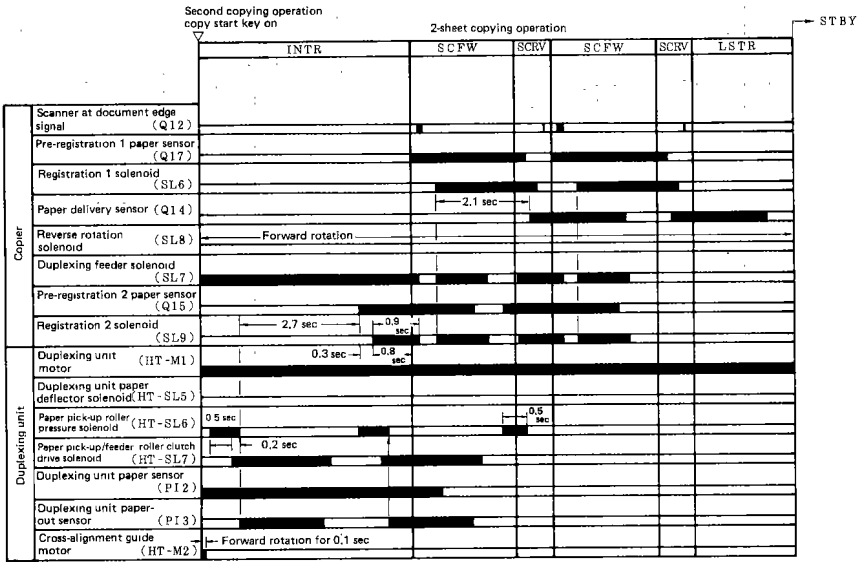

Figure 3-47g

L. Sequence of Operations for Cross-alignment and Trailing Edge Alignment

1. Sequence of Operations for Cross-alignment

When the copy-start key is switched on, the cross-alignment guide is not in the home position (HP) and the cross-alignment guide moves in the direction of the arrow ➡. When the signal generating plate on the cross-alignment guide blocks the home position sensor (PI4), the cross-alignment motor begins forward rotation moving the corss-alignment guide in the direction of the arrow ⇨.
The degree of forward rotation is determined by the size of the copy paper. (Please refer to Table 3-12a).

About 0.1 second after the first sheet of copy paper passes the paper-in sensor (PI2) of the duplexing unit, the cross-alignment motor rotates reversely (cross-alignment guide moves 5mm), then rotates forward (cross-alignment guide moves 9mm) and then rotates reversely (cross-alignment guide moves 4mm).

When the copy-start key for the second copying operation is switched on, the cross-alignment motor begins forward rotation (cross-alignment guide moves 4 mm).

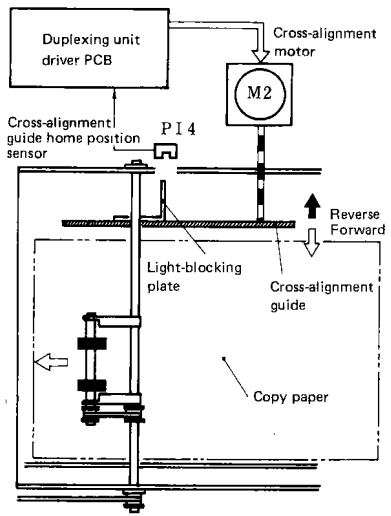

Figure 3-47h

Size of copy paper	Distance of cross-alignment guide movement
A3	No movement
B4/B5	40 mm
A4R	87 mm
B5R	115 mm
A4	No movement
Ledger/Letter	18 mm
Legal/Letter	81 mm

Table 3-12a

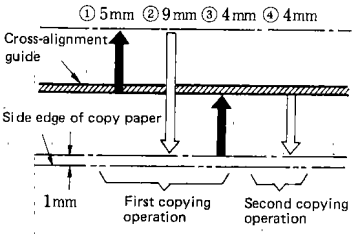

Figure 3-47i

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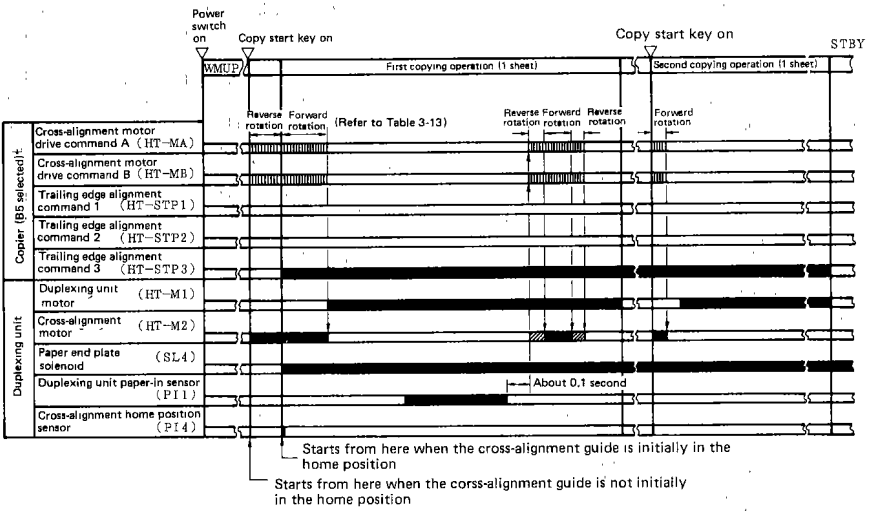
Power switch on
Copy start key on
Copy start key on
STBY
WMUP
First copying operation (1 sheet)
Second copying operation (1 sheet)
Reverse rotation
Forward rotation
(Refer to Table 3-13)
Reverse rotation
Forward rotation
Reverse rotation
Forward rotation
Copier (B5 selected)
Cross-alignment motor drive command A (HT-MA)
Cross-alignment motor drive command B (HT-MB)
Trailing edge alignment command 1 (HT-STP1)
Trailing edge alignment command 2 (HT-STP2)
Trailing edge alignment command 3 (HT-STP3)
Duplexing unit
Duplexing unit motor (HT-M1)
Cross-alignment motor (HT-M2)
Paper end plate solenoid (SL4)
Duplexing unit paper-in sensor (PI1)
About 0.1 second
Cross-alignment home position sensor (PI4)
Starts from here when the cross-alignment guide is initially in the home position
Starts from here when the corss-alignment guide is not initially in the home position

Figure 3-47j

2. Sequence of Operations for Trailing Edge Alignment

When the copy start key is switched on with the copier in duplexing unit mode, the signal for trailing edge alignment (HT-STP1-3) is transmitted to the duplexing unit driver PCB from the DC controller of the copier. The duplexing unit driver PCB then actuates the drive signal of the paper end plate solenoid.

As shown in Table 3-12b, when the paper end plate solenoids SL 1-4 go on, the paper end plate is raised so that the trailing edge of the copy paper is aligned.

All of the copy paper for the second copying operation is delivered from the duplexing unit. Paper end plate solenoids go off when the paper is finished.

Table 3-12b

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M. Fixing And Delivery Area

1. Outline

The upper and lower fixing rollers are driven by the main motor.

The upper fixing roller is heated by two heaters, and its surface temperature is sensed by thermistor TH1 and regulated by the DC controller.

Main heater (H1): 800W (100V, 115V)
1200W (220V, 240V)
Sub-heater (H2): 400W (100V, 115V only)

Control temperature: 180°C
Thermal switch operating temperature: 230°C
(Reset temperature: 0°C)

The cleaning belt drive solenoid (SL4) operates once for each copy, regardless of the size of the copy paper.

The thermal switch (TS1) cannot be used again after its contacts have opened unless it is cooled to 0°C. (The thermal switch will not return to its contact position even when the normal temperature has been restored.)

The scanner cooling fan (FM1) operates whenever the main motor operates. The exhaust fan (FM3) upper fixing roller reaches the valve at which the WARM-UP ROTATION stops, until the power switch is turned OFF.

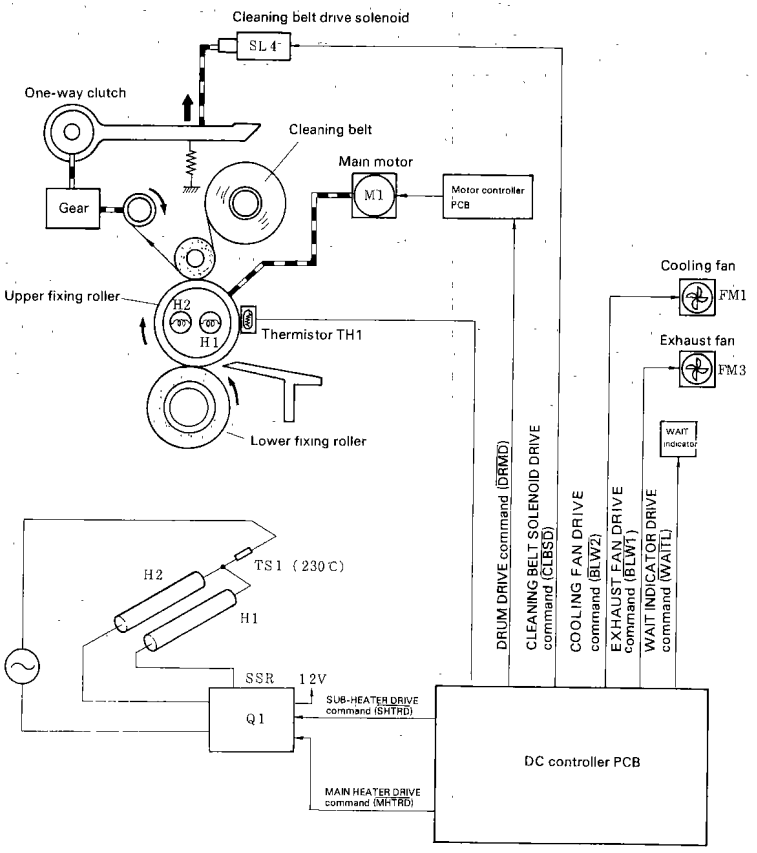

Figure 3-48

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2. Timing of operations related to fixing assembly

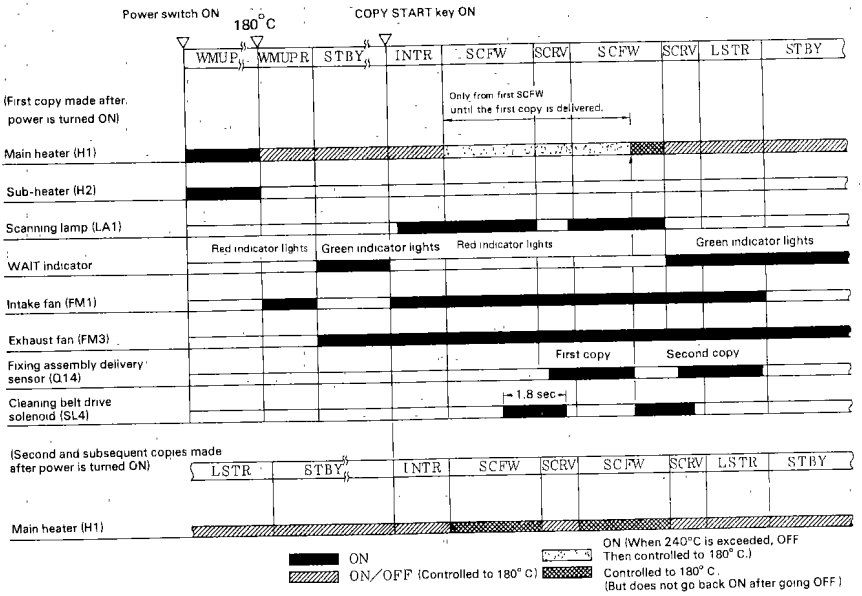

Figure 3-49

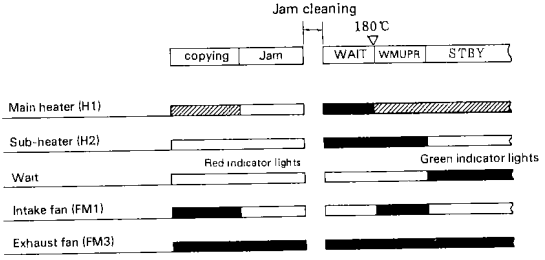

Figure 3-50 Timing when a jam occurs

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Heater/ indicator		Control operation	Period	Purpose/remarks
Main heater	1	ON	From power switch ON until fixing roller reaches 180°C	To increase fixing temperature
			From when scanner moves forward for first copy made after power switch ON, until copy is delivered	In the event that temperature doesn't reach 180°C Goes OFF if temperature exceeds 240°C
	2	ON/OFF	All periods except 1 and 3	To control fixing temperature at 180°C
	3	ON→OFF only	When scanner moves forward for second and subsequent copies after power switch ON	Prevents scanning lamp from flickering. (Scanning lamp might flicker due to low power if heater is ON.)
Sub-heater	1	ON	From power switch ON until fixing roller reaches 180°C	To increase fixing roller temperature
WAIT indicator	1	Red indicator lights	From power switch ON to end of WMUPR From when COPY START key is pressed until end of SCFW for last copy	To inform user that copier is in wait state or making copies
	2	Green indicator lights	All periods except 1	To inform user that copier is ready to make copies

Table 3-13

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N. Jam Detection

The sensors listed in Table 3-14 check whether the copy has been delivered correctly.

Paper detection sensors	NP-3725/ 3525	NP-3225/ 3025
Pre-registration sensor 1 (Q17)	○	○
Fixing roller delivery sensor (Q14)	○	○
Pre-registration sensor 2 (Q15)	○	–

Table 3-14

Paper jams can be identified by the microprocessor by reading signals from the sensors at predetermined times. If paper is at or not at a sensor, the microprocessor can identify if the copy is moving through the copier correctly.

If the microprocessor determines that there is a jam, the copy operation is interrupted, the last rotation starts, and the JAM LOCATION and JAM indicators flash. The motor then stops and the fixing roller heater goes OFF.

After the jam is cleared and the power switch is turned ON again, the two fixing heaters will go ON. When the temperature of the upper fixing roller reaches 190°C, the copier will perform the WARM-UP RORATION (WMUPR). This lasts for 1.5 seconds, and when completed the WAIT indicator changes from red to green.

The microprocessor identifies a jam for any of the following cases.

■ NP-3725/3525/3225/3025

1) When copy paper does not reach pre-registration sensor 1 within a certain time. (Registration roller 1 delay jam)
2) When the copy paper does not reach the fixing assembly delivery sensor within a certain time. (Outlet delay jam)
3) When the copy paper does not pass by the fixing assembly delivery sensor within a certain time. (Outlet stationary jam)

■ NP-3725/3525 Only

4) When the copy paper does not reach pre-registration sensor 2 within a certain time. (Registration roller 2 delay jam)
5) When copy paper does not arrive at the paper-in sensor area of the duplexing unit within a certain time. (duplexing unit inlet delay jam)
6) When copy paper does not arrive at the paper-out sensor area of the duplexing unit within a certain time. (duplexing unit outlet delay jam)
7) When copy paper does not arrive at the pre-registration 2 sensor area of the duplexing unit within a certain time during the second-copying operation. (duplexing unit second-copying registration 2 delay jam)

1. Registration roller 1 delay jam

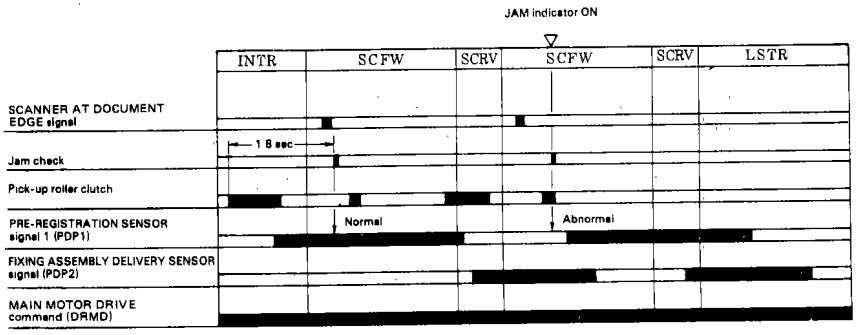

Figure 3-51

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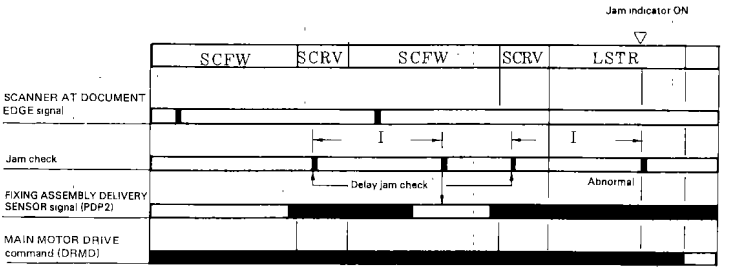
3. Outlet stationary jam



Note: For I, see Table 3-12

Figure 3-53

4. Registration roller 2 delay jam

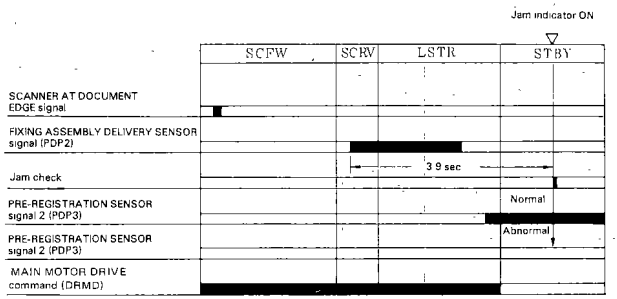


Figure 3-54

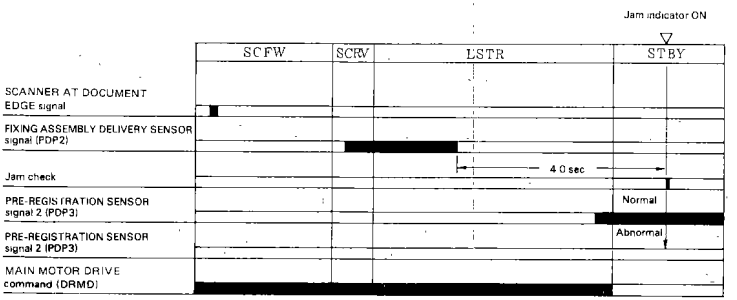


Figure 3-55

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2. Outlet delay jam

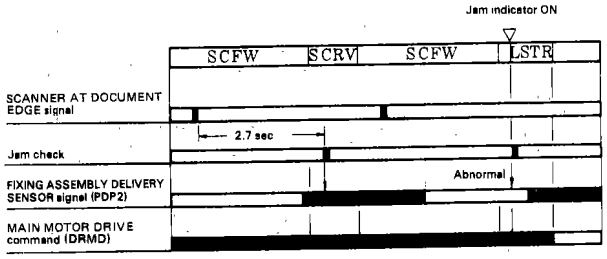

Figure 3-52

5. Duplexing unit inlet delay jam

First overlay copying operation in the duplexing unit.

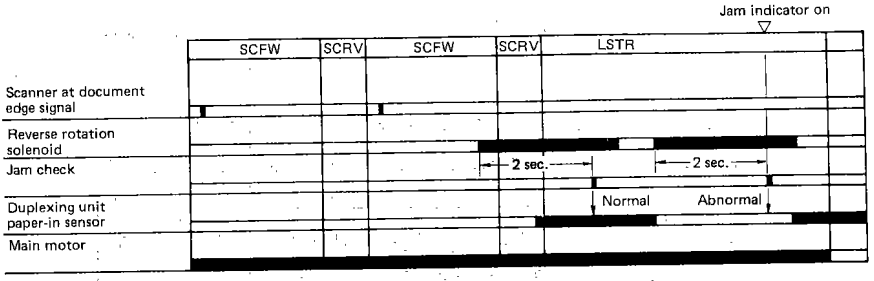

Figure 3-55a

First copying operation of two-sided copying in the duplexing unit

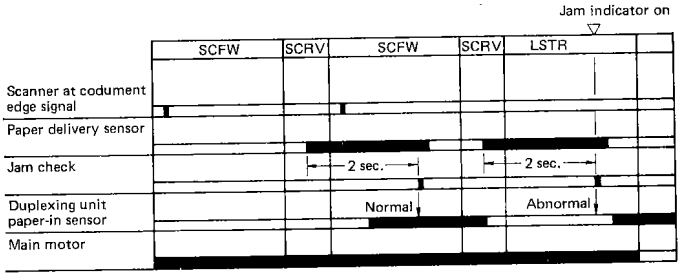

Figure 3-55b

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6. Duplexing unit outlet delay jam

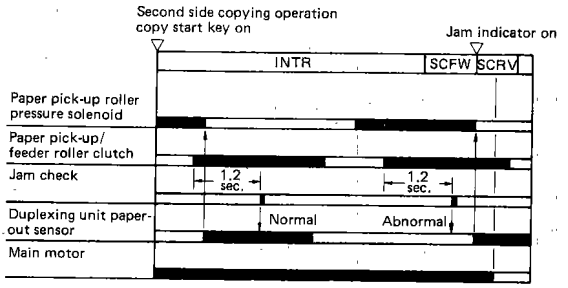

Figure 3-55c

7. Duplexing unit second-copying registration 2 delay jam

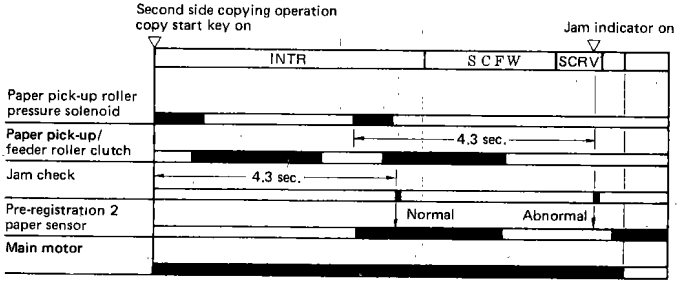

Figure 3-55d

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V. CONTROL SYSTEM

A. Reading Input Keys

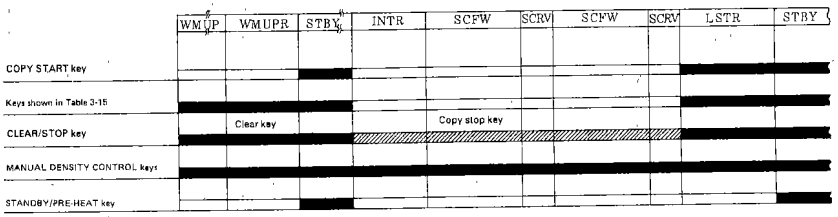

Figure 3-56

NP-3725/3525/3225/3025	NP-3725/3525 only
INPUT keyboard, ASTERISK key, STANDARD MODE key, COLOR SELECTION key, DENSITY RECALIBRATION keys, MANUAL DENSITY CONTROL keys, DIRECT COPY reduction, ENLARGEMENT key, VARIABLE REPRODUCTION RATIO keys, AUTOMATIC DENSITY CONTROL key, AUTOMATIC PAPER SELECTION key, AUTOMATIC REPRODUCTION RATIO key, VARIABLE REPRODUCTION RATIO MEMORY keys, MEMORY INPUT keys, SORT MODE key, TWO-PAGE SEPARATION key	ERASING MODE key, TWO-SIDED COPY key, IMAGE OVERLAY key, X-Y MODE key, COPY COLOR CONVERSION SELECTION key, image editing unit keys

Table 3-15

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B. Alarm Indicators

The five alarm indicators on the copier control panel are listed below.

1. JAM LOCATION indicator
2. PAPER OUT indicator
3. TONER OUT indicator
4. CONTROL CARD/COUNTER CHECK indicator

If all of these indicators are OFF and the temperature of the fixing assembly reaches the required value (see page 3-32), the WAIT indicator lights green. This indicates that the copier is ready for copying.

The timing for the lighting of the JAM LOCATION indicator has already been described, so only a brief description will be provided here. (Refer to page 3-35 for details.) Table 3-16 shows the conditions and timing for the lighting of the PAPER OUT indicator, TONER OUT indicator, and the CONTROL CARD/COUNTER CHECK indicator.

No.	Item	Indication	Conditions for lighting	Lighting operation (A) When power switch is ON	(B) During copying	(C) During STAND-BY	(D) Other
1	PAPER OUT indicator		The selected cassette holder: · Has no cassette loaded · Has no paper in the cassette		Lights when scanner is moving in reverse		
2	TONER OUT indicator		Developing assembly is not installed.	Flashes immediately		Flashes immediately	
			The toner level in the developing assembly is below a certain level	Lights when main motor stops (Does not light if the main motor operates less than 30 seconds after the front door is closed.)			
3	CONTROL CARD/COUNTER CHECK indicator		Control counter/card is not in place	Flashes immediately			

Table 3-16

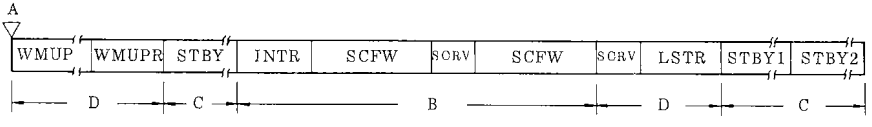

Figure 3-57

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■ Black toner out detection

If the black toner sensor detects that there is no black toner, after the power switch has been turned ON and the warm-up rotation is complete, the hopper motor is rotated for 10 seconds and toner is supplied from the hopper to the black developing assembly.

If during copying the black toner sensor detects that there is no toner, the hopper motor is rotated for as long as the "toner-out" detection lasts. However to avoid any effect from the stirring rod, if toner supply rotation continues for 2.5 seconds the toner out signal flashes, indicating that there is no toner. If rotation continues for 1 second, the toner out signal does not flash, indicating that toner is present.

If no black toner is detected for 180 seconds, the hopper motor goes OFF. After the set number of copies has been made, the TONER OUT indicator flashes.

When the ADF is used, the document on the copyboard glass is fed out after the set number of copies has been made.

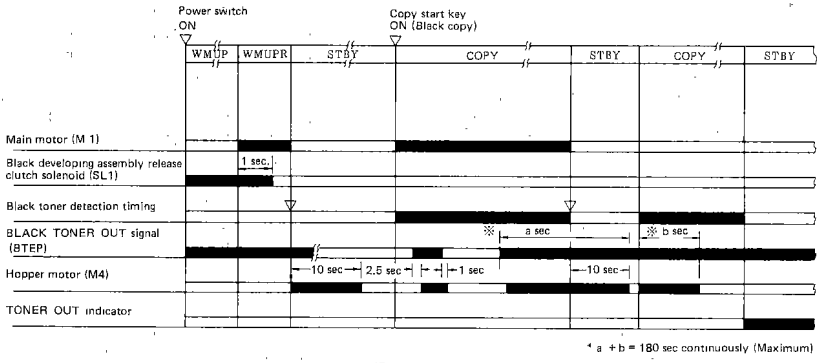

Figure 3-58

■ Color toner out detection

After the power switch has been turned ON, INTR1* occurs for the first color copy that is made. If the color toner detection circuit detects no color toner after forward rotation 1 is completed, color toner supply rotation (CTSR)* occurs until toner has been detected. If CTSR continues for 64 seconds, the main motor goes OFF and the TONER OUT indicator flashes.

If the color toner detection circuit does not detect toner during copying, the operation is temporarily halted at that point, the scanner returns to home position, and CTSR occurs until toner is detected. If CTSR continues for 40 seconds, the main motor goes OFF and the TONER OUT indicator flashes. (After color toner is supplied, press the COPY START key to make the remaining number of copies in the interrupted copy run. If the ADF is used, the document on the copyboard glass is not fed out.)

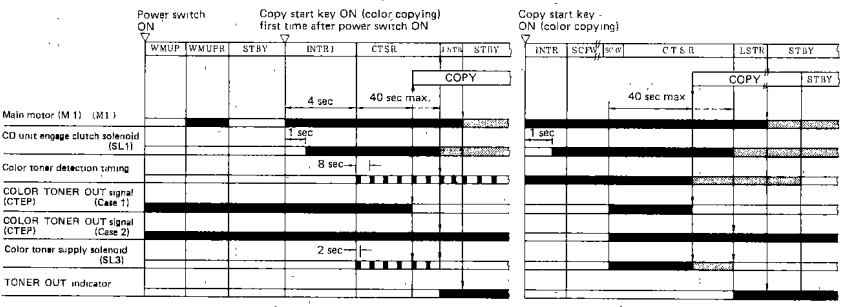

Figure 3-59

Note:

*INTR1/CTSR: Main motor ON, high voltage transformer ON, developing bias ON, blank exposure lamp ON, CD unit engage clutch solenoid ON.

C. Self-diagnosis

The microprocessor on the DC controller PCB regularly checks conditions in the copier, especially sensor outputs. If a malfunction is detected, the relevant error code is displayed on the COPY NUMBER display.

The following chart shows the meaning of each error code and the timing of the checks that are performed.

Example: For the code E000, E0 and 00 light alternately.

Error code	Major cause	Detection timing
	One or more of the following is detective: Thermistor TH1, heater H1 or H2, thermal switch, SSR (Q1) DC controller PCB.	· If the temperature of the fixing roller does not reach 100°C within 60 seconds after the power switch is turned ON. · If the temperature goes below 100°C for more than 70 seconds after the temperature of the fixing roller has reached 180°C.
	One of the following is detective: Main motor (M1), motor controller PCB, motor driver PCB, DC controller PCB.	· The main motor clock pulse (MMCLK) stays HIGH or LOW for more than 2 seconds while the DRUM DRIVE command is being generated.
	The counter circuit is open. The DC controller PCB is defective.	Check immediately before counter ON or OFF (When counter is ON, COUNTER DRIVE command = 0 is normal. When counter is OFF, COUNTER DRIVE command = 1 is normal.)
	Defective cross-alignment in duplexing unit One or more of the following is defective: cross-alignment motor (HTM2), cross-alignment home position sensor (PI2), duplexing unit driver, DC controller	If the cross-alignment home position is not detected within 3 seconds after the cross-alignment motor goes on when first-side copying operation commences.
	One or more of the following is defective: cross-ways registration cam home position sensor (Q18), cross-ways registration solenoid (SL10), DC controller PCB	If the cross-ways registration cam home position (RGHP = 0) is not detected within 1.6 seconds after the cross-ways registration solenoid (SL10) goes ON.
	One or more of the following is defective: Scanner reverse position sensor (Q13), scanner motor (M2), motor controller PCB, motor driver PCB, DC controller PCB	If SCBP is "1" when scanner begins to move forward
	One or more of the following is defective: Scanner home position sensor (Q11), scanner motor (M2), motor controller PCB, motor driver PCB, DC controller PCB	If the scanner does not return to its home position (SCHP = 1) within 4 seconds after the main motor goes ON.
	One or more of the following is defective: Scanner at document edge sensor (Q12), scanner reverse position sensor (Q13), scanner motor (M2), motor controller PCB, motor driver PCB, DC controller PCB	If the SCANNER AT DOCUMENT EDGE signal (SCDP) is not sent within 2 seconds after scanner begins to move forward.
	One of the following is defective: lens home position sensor (Q23), lens drive motor, DC controller PCB	If the lens is not in the lens home position (LHP = 1) within 6 seconds after the power switch is turned ON, or if the lens does not leave the lens home position within 0.6 seconds after LHP = 1.

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Error code	Major cause	Detection timing
E220	The lens home position sensor or the DC controller PCB is defective, or the lamp (LA1) circuit or fuse (FU1) circuit is open	· Always detected during STANDBY · During copying, checked immediately before blank explosure lamp goes OFF · Otherwise, checked immediately before or after the lamp goes ON or OFF (When lamp is ON, LAON should be "1" When lamp is OFF, LAON should be "0")
E240	DC controller PCB is defective	The serial communications port of the master or slave microprocessor on the DC controller PCB is not working correctly
E400	Defective DF unit DF controller PCB, interface PCB, or DC controller PCB is defective	The serial interface between the DF unit and the copier is not working correctly.
E500	Defective sorter controller PCB, interface PCB or DC controller PCB	· After the COPY START key is pressed ON, if the sorter STANDBY signal (SSTBY = 1) is not sent within 15 seconds after the INITIAL ROTATION begins · The serial interface between the sorter and the copier is not working correctly.
E620	Defective editor controller PCB, interface PCB or DC controller PCB	The serial interface between the editor and the copier is not working correctly.

Reference:

1. E204 is not displayed if an abnormality occurs during copying.
2. If the self-diagnostic function identifies a fault, the indication (except "E000") can be canceled by turning the power switch OFF and then ON again. However, this cannot be done if "E000" is displayed. This prevents the user from resetting the copier easily when the fault is a failed thermistor; resetting the copier in such a case would likely overheat and damage the fixing rollers.
   When E000 occurs, it is stored in the RAM or the DC controller PCB, and must be cleared to reset the copier. The procedure for this is given below.
   1) Open the front door.
   2) Insert the door-switch actuating tool (TKN-0093) into the door switch assembly.
   3) Press switch SW501 on the service mode PCB.
   4) Remove the door-switch actuating tool.

I. GENERAL

A. Outline of Electrical Circuits

Five microprocessors on the DC controller PCB control all major electrical operations in the NP-3725/3525 (The NP-3225/3025 has four microprocessors.) Their functions are as follows:

Q101 (CPU)
Control of copying operation

Q102 (LED driver) NP-3725/3525 only
Control of blank exposure lamp

Q107 (Keys and indicators 1)
Control of control panel key input
Control of control panel indicator output

Q108 (Keys and indicators 2)
Control panel indicator output

Q116 on NP-3725/3525 or Q111 on NP-3225/3025 (D/A converter)
Image formation system control signal output

The microprocessors are programmed to read input signals from the sensors, control panel keys, and the other PCBs.

In response, they send commands to drive loads (motors, solenoids, lamps and other devices) and they send control signals to the other PCBs.

Q101 is connected to both ROM and RAM chips. The copying operation program is stored in ROM, and the settings for the variable reproduction ratio memory, the area settings, and the service mode settings are stored in RAM. The DC controller has two lithium batteries for backup to prevent the contents of RAM from being lost in case the power supply is cut off.

Interface PCBs are used for communication with the DF feeder and the sorter.

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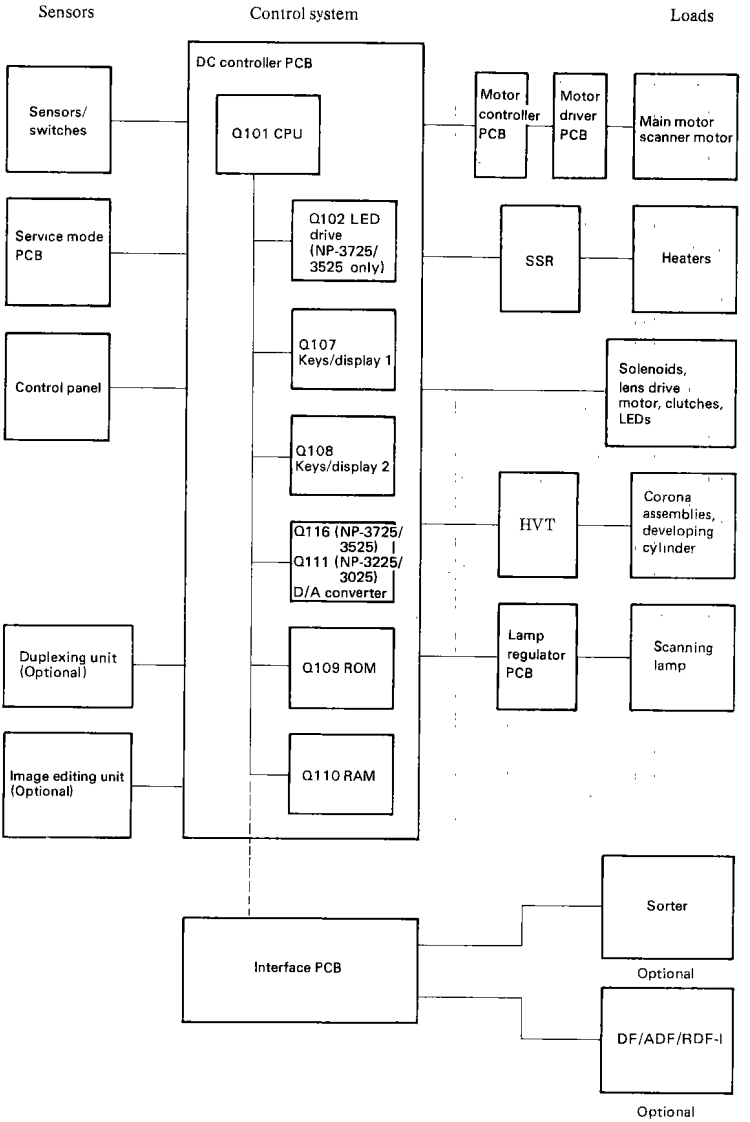

Figure 4-1

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II. DC CONTROLLER PCB INPUTS

A. NP-3725/3525

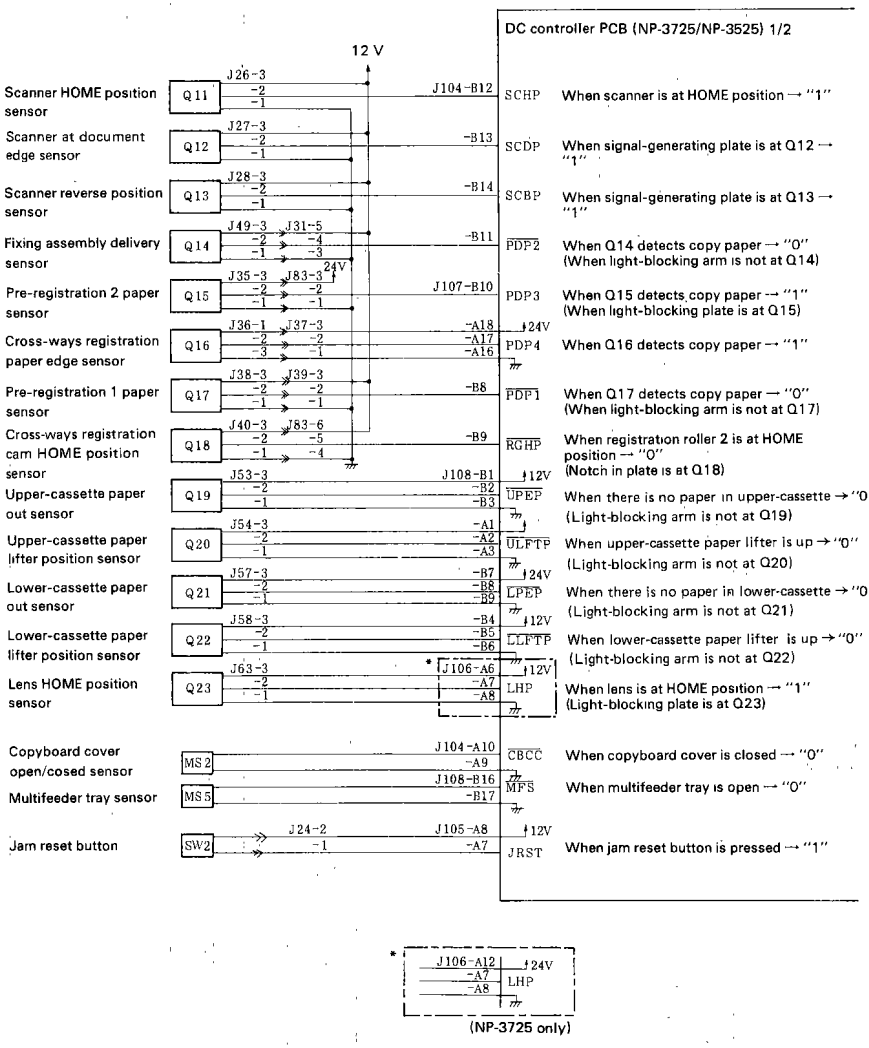

Figure 4-2

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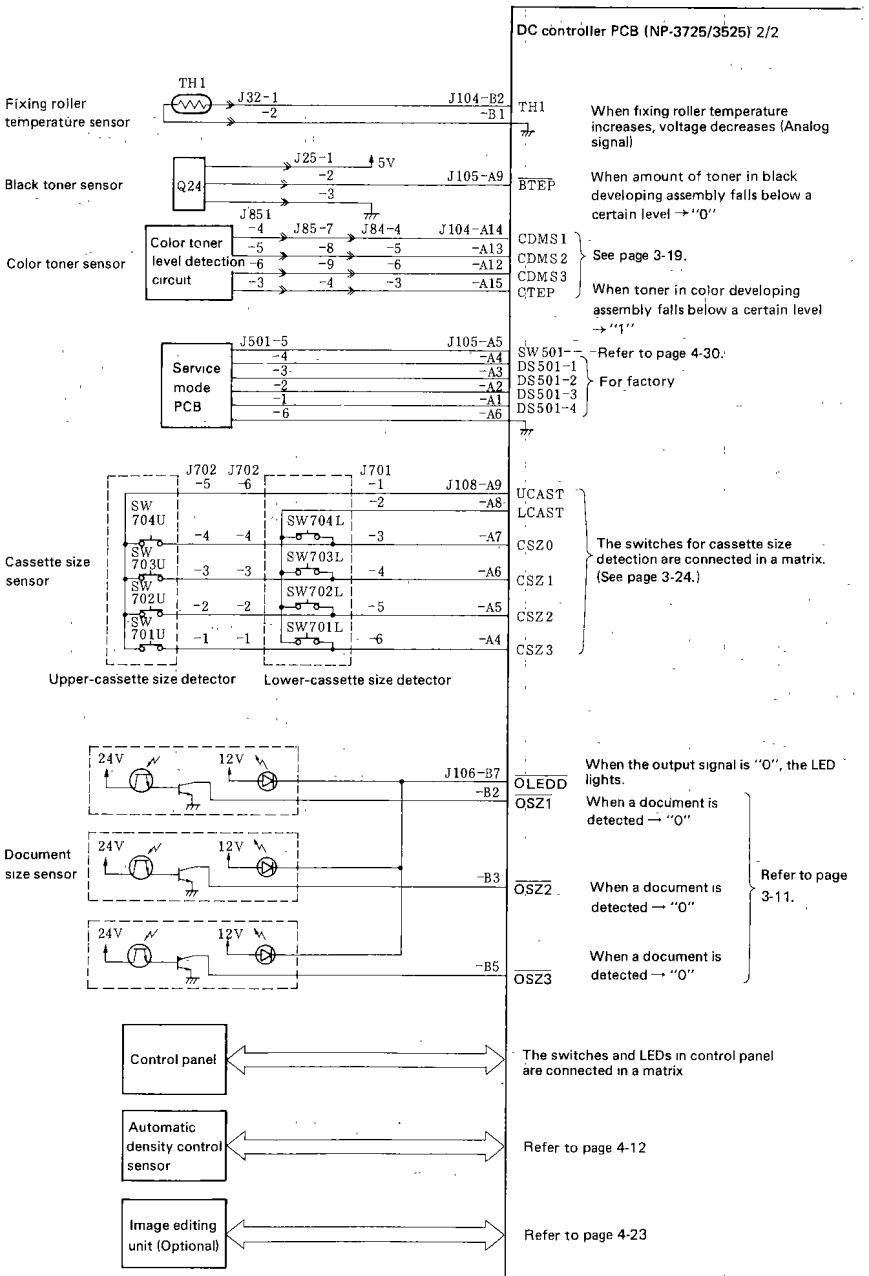

Figure 4-3

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B. NP-3225/3025

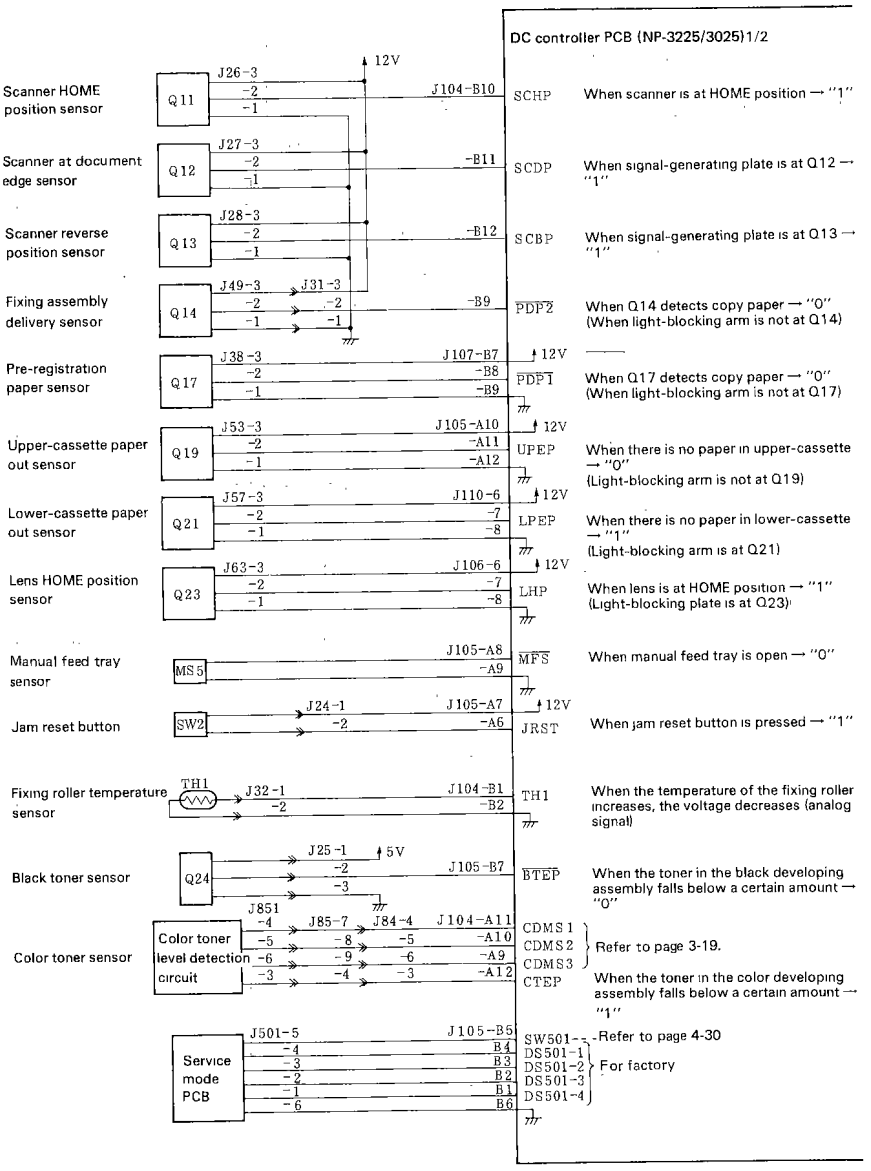

Figure 4-4

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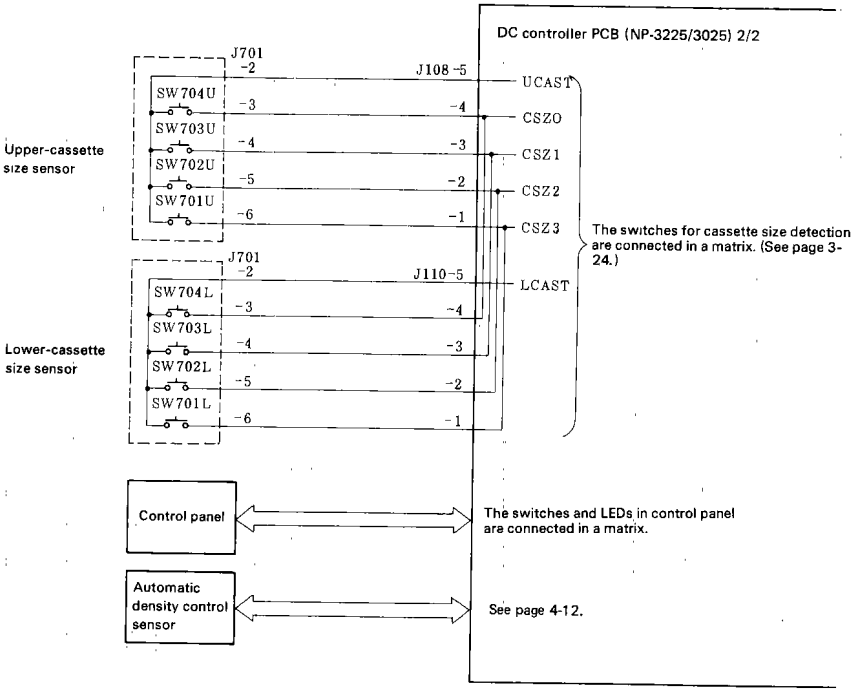

Figure 4-5

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III. DC CONTROLLER PCB OUTPUTS

A. NP-3725/3525

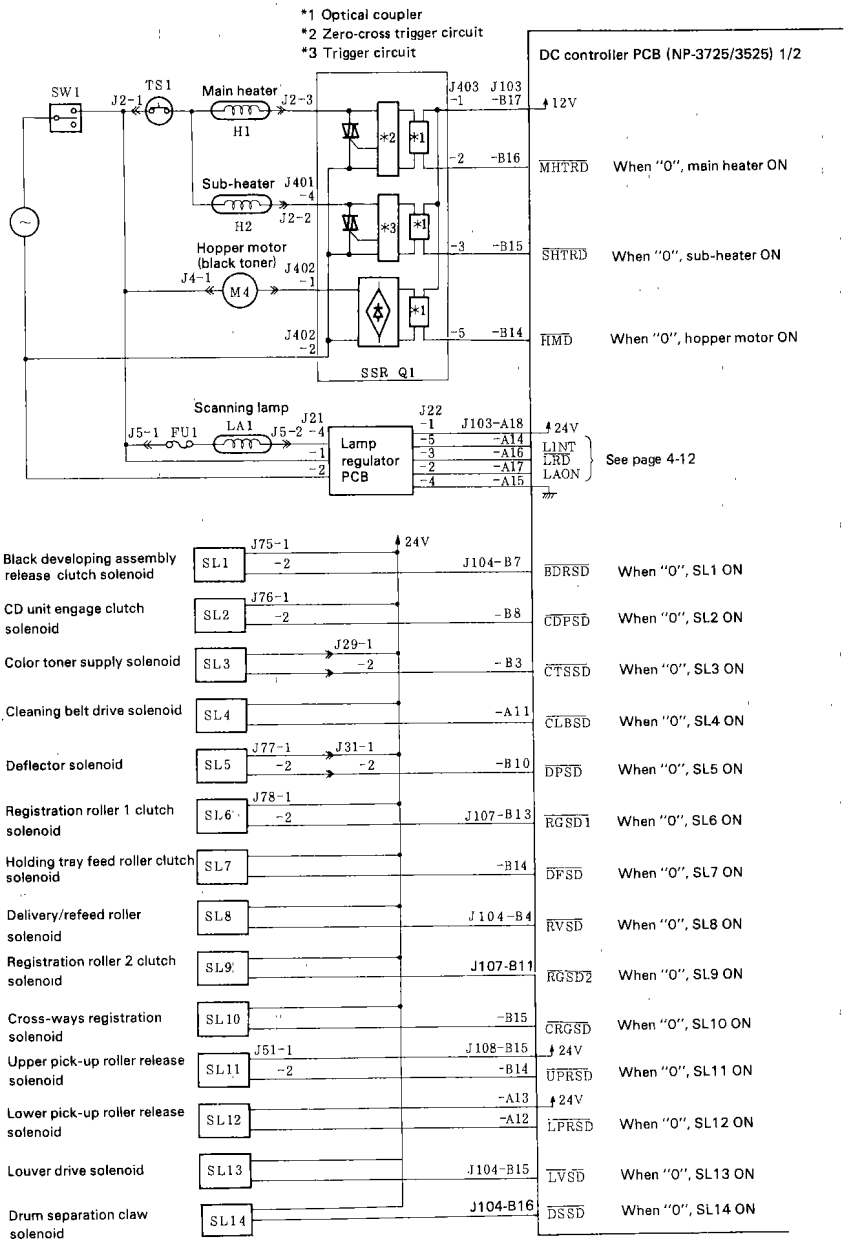

Figure 4-6

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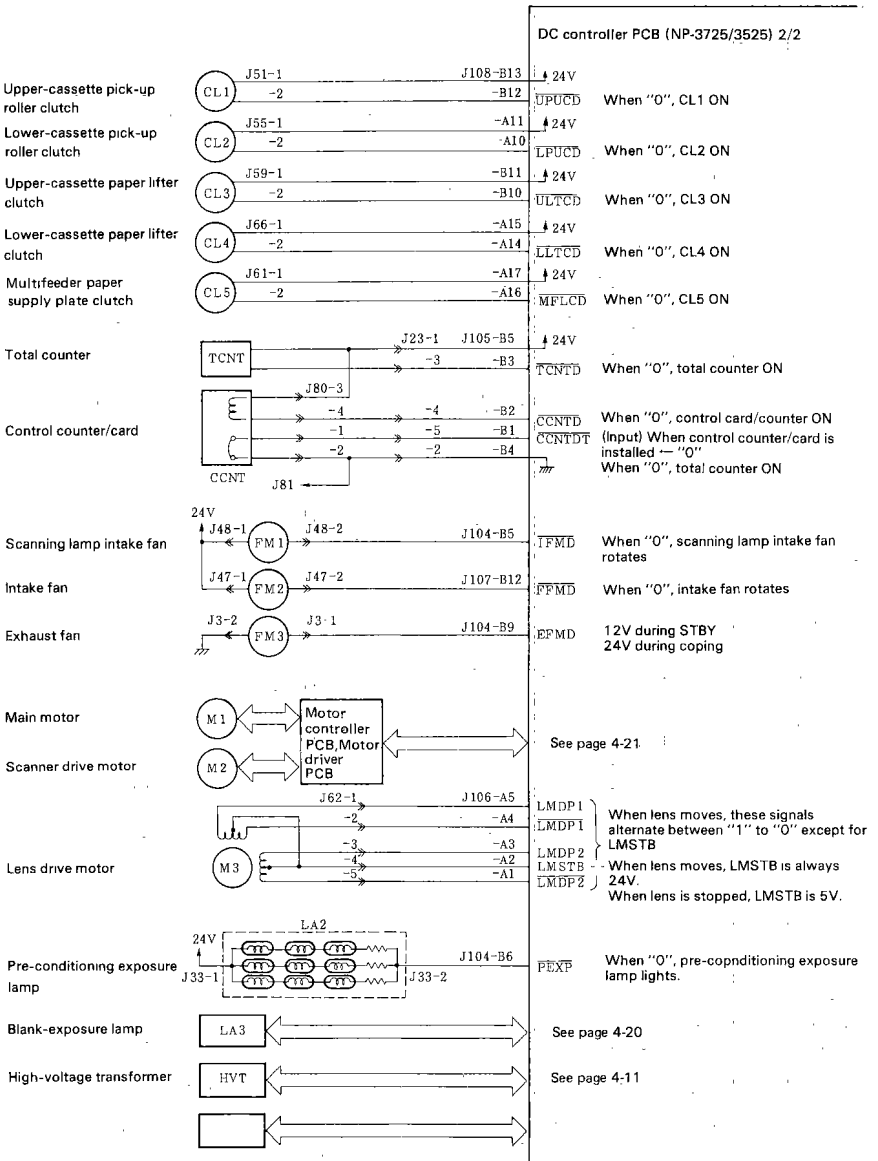

Figure 4-7

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B. NP-3225/3025

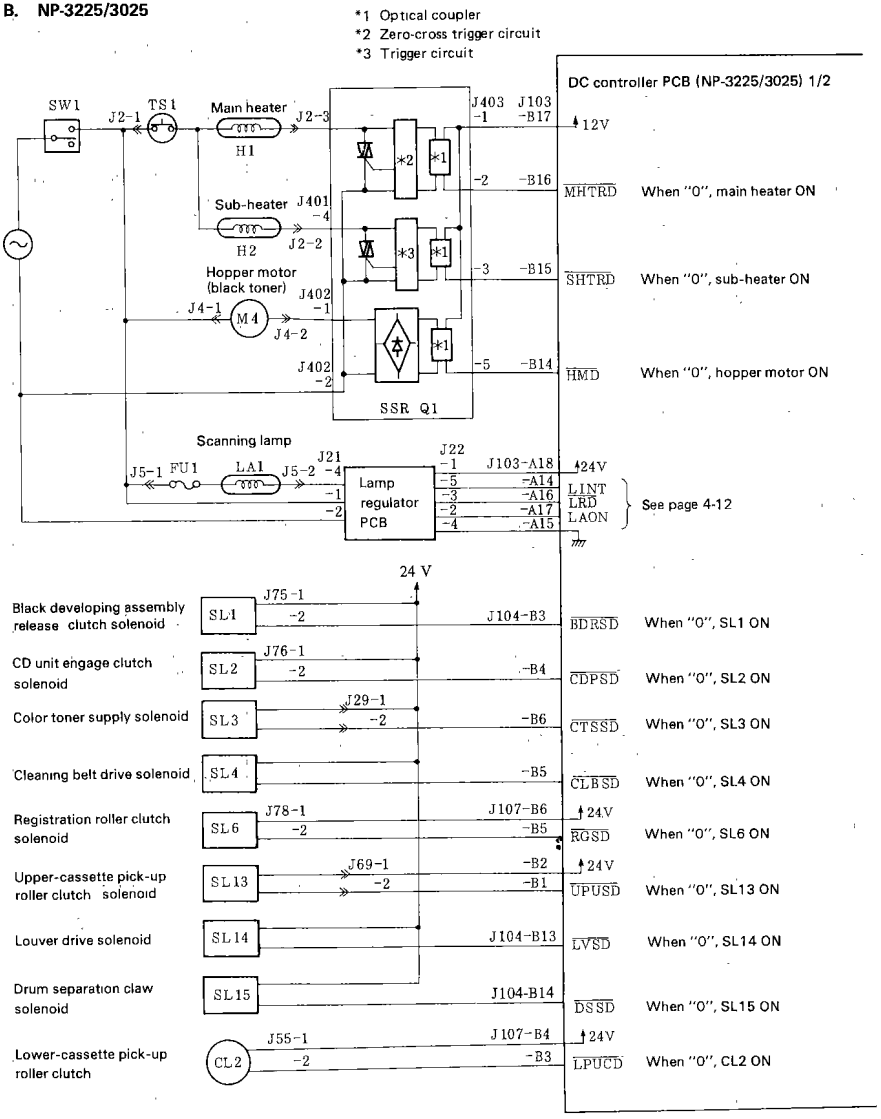

Figure 4-8

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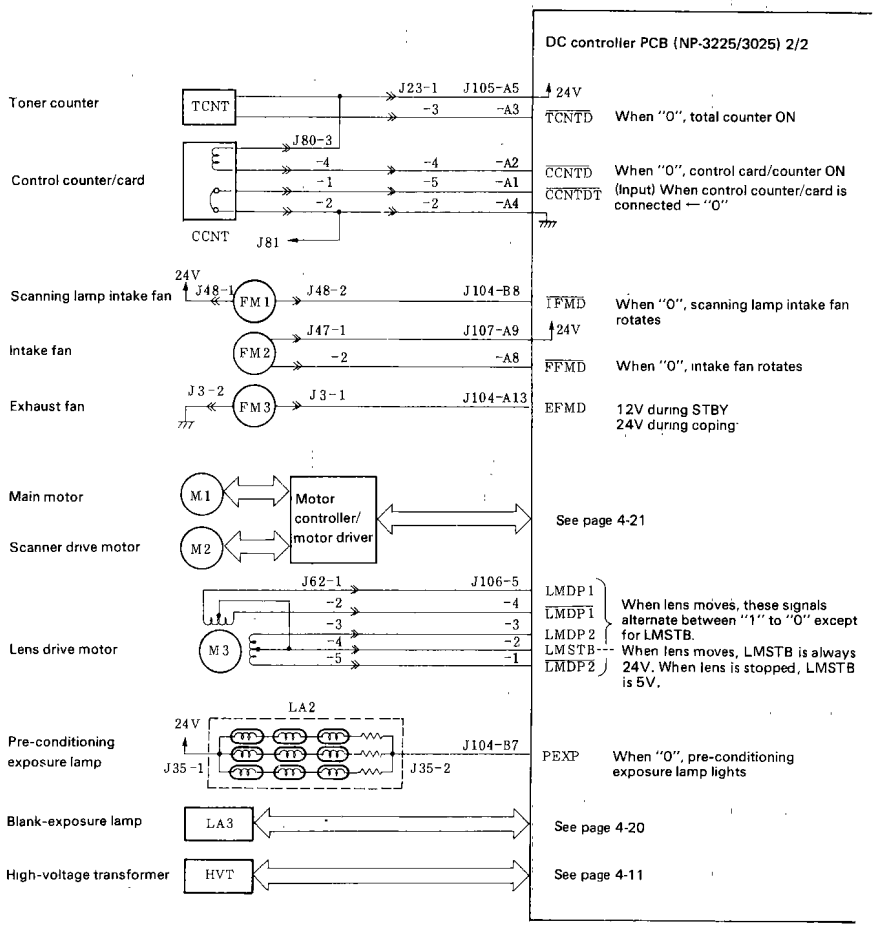

Figure 4-9

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IV. MISCELLANEOUS CONTROL CIRCUITS AND THEIR FUNCTIONS

A. Image Formation Circuits

1. Outline

Figure 4-10 shows the main components involved with the image formation process. There are five circuits:

Scanning lamp intensity control circuit
Primary/transfer corona current control circuit
Pre-transfer/separation corona current control circuit
Developing bias control circuit
Blank-exposure lamp control circuit

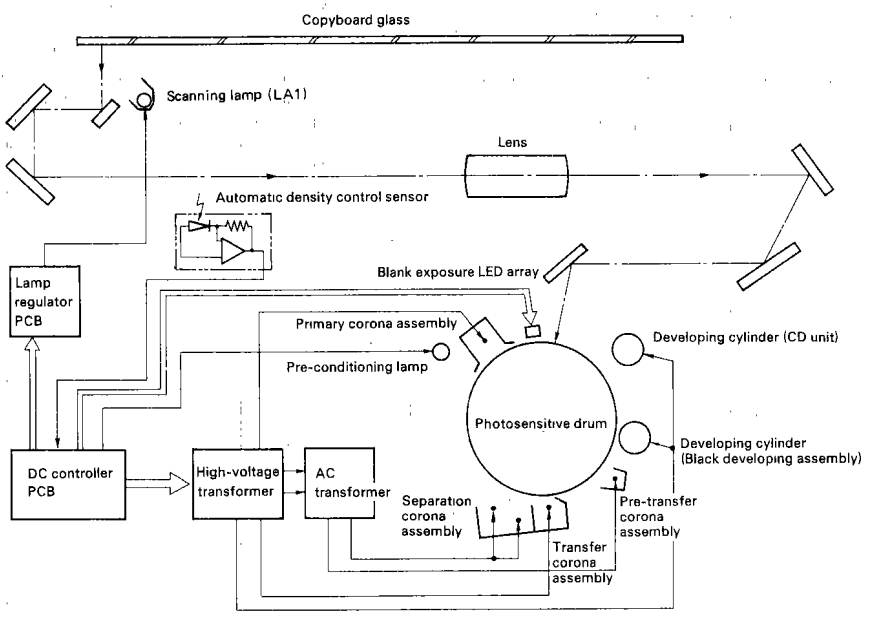

Figure 4-10

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2. Lamp intensity control circuits

a. Outline

The circuit shown in Figure 4-11 controls the intensity of the scanning lamp. It has the following functions:

1) Switches scanning lamp ON/OFF
2) Detects whether the scanning lamp is ON (Self-diagnostic function for the triac triggering circuit on the lamp regulator PCB)
3) Controls intensity of scanning lamp
   - Intensity held constant despite fluctuations in power supply voltage.
   - Varies intensity in response to operation of MANUAL DENSITY CONTROL keys (Manual density control mode)
   - Varies intensity depending on density of original (Automatic density control mode ..... AE)

Note: The differential amplifier circuit and the phase control circuit, shown separately in Figure 4-11, are contained on the same IC.

b. Operation

1) Switching scanning lamp ON/OFF
   When $\overline{LRD}$ = "1", the output of the lamp regulator switching circuit is "0", and power is not supplied to the phase control circuit. As a result, the triggering circuit for the triac is OFF, and therefore the scanning lamp (LA1) is also OFF.
   When $\overline{LRD}$ = "0", the output of the lamp regulator circuit is "1" (24V is supplied to the phase control circuit), so the triggering circuit for the triac operates, and the scanning lamp (LA1) goes ON.
2) Detecting whether scanning lamp is ON
   When the scanning lamp (LA1) is ON, (the triggering circuit for the triac is operating), the lamp ON detection circuit also operates, and its output (LAON) is "1".
   This signal is sent to the DC controller PCB as part of the self-diagnostic function. This ensures detection if the lamp regulator or thermal fuse fails, or if the scanning lamp does not operate with the proper timing. Error code E220 is then displayed on the control panel.

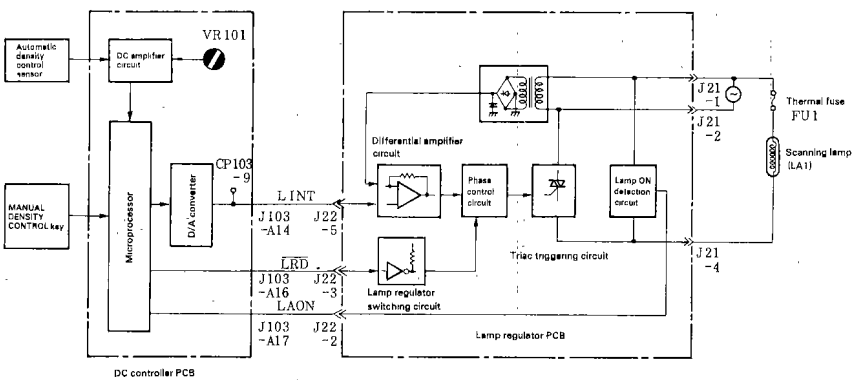

Figure 4-11

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3) Control of scanning lamp intensity

The intensity of the scanning lamp is increased or decreased by changing the voltage that is applied to the scanning lamp. The voltage applied to the scanning lamp is proportional to the magnitude of the LINT signal sent from the DC controller PCB.

LINT varies within the range from 10V to 16V according to the setting of the MANUAL DENSITY CONTROL keys or the density of the original. The effective (RMS) voltage applied to the scanning lamp is controlled by the phase control circuit and is in the range from 45 to 80V.

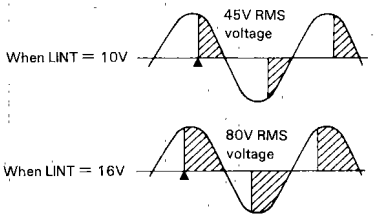

Figure 4-12

The shaded area in Figure 4-12 indicates the part of the AC waveform that is applied to the scanning lamp.

LINT voltage increases
└ Differential amplifier output increases
└ Triac is triggered earlier (indicated by ▲ in Figure 4-12)
└ RMS voltage to LA1 increases
└ LA1 intensity increases

When the LINT signal is unchanged, but the line voltage fluctuates, the phase control circuit maintains a constant RMS voltage to the load. This prevents fluctuations in the line voltage from affecting the lamp intensity and changing the copy density.

Figure 4-13 shows how the phase control circuit triggers the triac to maintain the applied RMS voltage (the shaded area) constant.

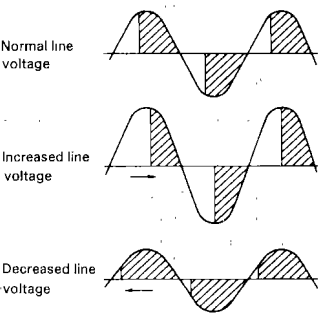

Figure 4-13

Line voltage "increases"
└ Line voltage detector output "increases"
└ Differential amplifier output "decreases"
└ Trigger point "retarded"

c. Check points

- Checking voltage at J103-A16 (DC controller PCB)

The voltage between GND J103-A16 ($\overline{\text{LRD}}$) on the DC controller and is about 0V when the scanner is moving forward, approximately 16.5V when scanner is moving in reverse, INITIAL ROTATION, and LAST ROTATION.

If voltage measurements are not as described above, the problem is probably on the DC controller PCB.

- Checking voltage at CP103-9 (DC controller PCB)

The voltage between CP103-9 (LINT) on the DC controller PCB and GND should be in the range from 10 to 16V during copying.

The voltage changes when the MANUAL DENSITY CONTROL keys are pressed.

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d. Adjustment of the exposure intensity and the automatic density control

Table 4-1 shows the adjustments that can be made in the scanning lamp intensity control cuicuit. The adjustments are made in service mode as described in section VII "SERVICE MODE".

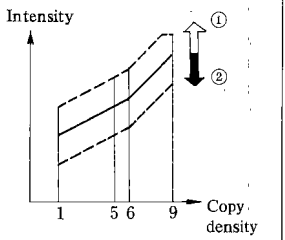
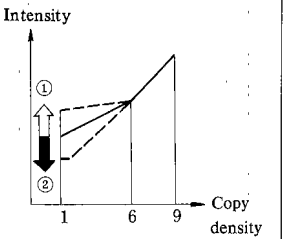
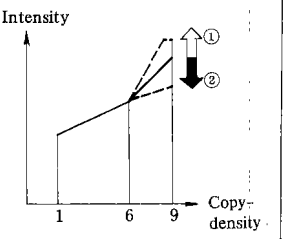
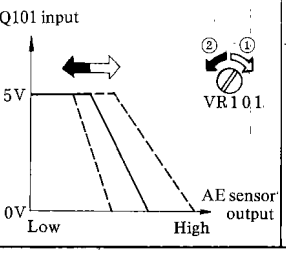
Adjustment method	Used to control	Density/Intensity graph	Remarks
Adjustment mode 3	Advistment for optimum exposure (Intensity adjustment for a copy density of 5)		1 If value set in service mode is increased → The lamp intensity during copying increases so the copy density decreases. 2. If value set in service mode is decreased. → The lamp intensity during copying decreases, so the copy density increases.
Adjustment mode 4	Slope for copy densities below 6		1. If value set in service mode is decreased → The lamp intensity increases for copy densities less than 6. 2. If value set in service mode is increased. → The lamp intensity decreases for copy densities less than 6.
Adjustment mode 5	Slope for copy densities above 6		1. If value set in service mode is increased. → The lamp intensity increases for copy densities over 6. 2. If value set in service mode is decreased → The lamp intensity decreases for copy densities over 6.
VR101	Adjustment of automatic density control reference point (Adjustment of gain of the DC amplifier circuit)		Refer to page 4-15 for details on the adjustment method.

Table 4-1

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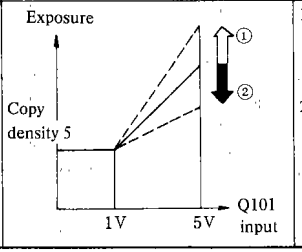
Adjustment method	Used to control	Density/exposure graph	Remarks
Adjust-ment mode 0	Slope for automatic density control		1. If value set in service mode is increased → The copy density for a newsprint original decreases. 2. If value set in adjustment mode is decreased → The copy density for a newsprint original increases.

Table 4-1 (Continued)

Note: If the set values in adjustment mode 3, 4 or 5 have been changed:

It may not be possible to change the scanning lamp intensity using the MANUAL DENSITY CONTROL keys because the values stored for these adjustment modes may not be within the allowed range. For a copy density of 9, the value should be 802 or less; for a copy density of 1, the value should be 428 or above.

Copy density 9 = (Adjustment mode 3 value) + (Adjustment mode 4 value) x 2 + (Adjustment mode 5 value) x 6

Copy density 1 = (Adjustment mode 3 value) - (Adjustment mode 4 value) x 8

Example:

If the value set for adjustment mode 4 is seven and the value set for adjustment mode 5 is fourteen, then the value set for adjustment mode 3 should be within the following range:

484 < Adjustment mode 3 value < 704

e. Adjusting the automatic density control reference point (VR101A, VR101B)

If the adjustment mode 3 setting is changed, the AE sensor or the DC controller is replaced or a DF is installed in the field, adjust VR101A and VR102B on the DC controller, following the procedure described below.

1) Remove the rear panel.
   Open the front door and remove the counter cover. Place test sheet NA2 or NB3 on the copyboard.
2) Insert the door switch actuating tool to actvate the door switch. Wait until the WAIT indicator lights green.
3) Press SW501, the pushbutton switch for the service mode PCB.
   This puts the copier in service mode. 00 will be displayed on the copy number display on the control panel.
4) Input 0 and 2 using the control panel INPUT keyboard.
5) Press the COLOR SELECTION key
   The scanning lamp will light for copy density 5. The scanner will repeatedly scan between its home position and the AE density measuring position. The output of the AE sensor, which was read by the microprocessor on the DC controller, will be displayed on the REPRODUCTION RATIO/ AREA SET display.

Example: | 0 | 6 | 3 | ——→ 0.63V

REPRODUCTION RATIO/ AREA SET display

6) Set VR101B (fine adjustment) on the DC controller to the middle position in its range of rotation.
7) Set VR101A (gross adjustment) so that the REPRODUCTION RATIO/AREA SET display is almost as shown in Table 4-2.
8) Turn VR108B (fine adjustment) to fine tune the adjustment so that the value displayed on the REPRODUCTION RATIO/AREA SET display is within the range shown in Table 4-2.

Test sheet	REPRODUCTION RATIO/ AREA SET display
NA2	100 ± 10
NB3	100 ± 10

Table 4-2

9) Press the R key to cancel service mode.

Steps 5) through 9) must be performed within one minute. If the scanning lamp is left on for too long, the fuse may blow and the copyboard cover may become warped by the heat.

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3. Control of primary/transfer corona current

a. Outline

The circuit shown in Figure 4-14 controls the primary and transfer coronas. It has the following functions:

- Switching primary/transfer corona current ON/OFF
- Maintaining primary corona current constant
- Switching magnitude of transfer corona current

To prevent the operating environment from affecting the corona discharge, the primary corona current is maintained constant. The transfer corona current follows the primary corona current.

The following two signals are output from the DC controller PCB to control the ON/OFF switching of the primary/transfer corona current and to switch the transfer corona current to one of two values.

- HVPR (PRIMARY CORONA CURRENT CONTROL command)
- HVTR (TRANSFER CORONA CURRENT CONTROL command)

b. Operation

HVPR switches the primary/transfer corona current ON and OFF. The differential amplifier circuit, shown in Figure 4-14, operates when HVPR is 8V or more.

1) When the primary/transfer corona high voltage output is ON:

HVPR is approximately 14.7V
→ Differential amplifier circuit "ON"
→ Variable pulse width oscillator circuit "ON"
→ LED 1 lights
→ High-voltage transformer for primary corona "ON"
→ High-voltage transformer for transfer corona "ON"

The high-voltage transformer for the transfer corona outputs a voltage to the transfer corona that is proportional to HVTR. HVTR is normally 8.4V. It is decreased to 6.8V during the second copying operation for overlay or two-sided copying.

If changes in the operating environment cause the current from the primary corona assembly to rise above the a certain level, the level of the feedback signal to the differential amplifier circuit increases, so the output of the differential amplifier circuit decreases. this reduces the output current of the primary/transfer corona assembly to maintain it at a constant level.

2) When the primary/transfer corona high voltage output is OFF:

HVPR is approximately 7V
→ Differential amplifier circuit "OFF"
→ Variable pulse width oscillator circuit "OFF"
→ LED 1 goes out
→ High-voltage transformer for primary corona "OFF"
→ High-voltage transformer for transfer corona "OFF"

The value of HVTR is 8.4V.

c. Check points

Checking voltage at CP103-4 (DC controller PCB)

- The voltage between CP103-4 (HVPR) and GND is approximately 14.7V during copying and 7V during STANDBY.
- Checking voltage at CP103-7 (DC controller PCB)
  The voltage between CP103-7 (HVTR) and GND is approximately 8.4V during STANDBYand the first copying operation, and 6.8V during the second copying operation for two-sided and overlay copying.
- Checking LED1 (HVT)
  LED1 lights during copying.

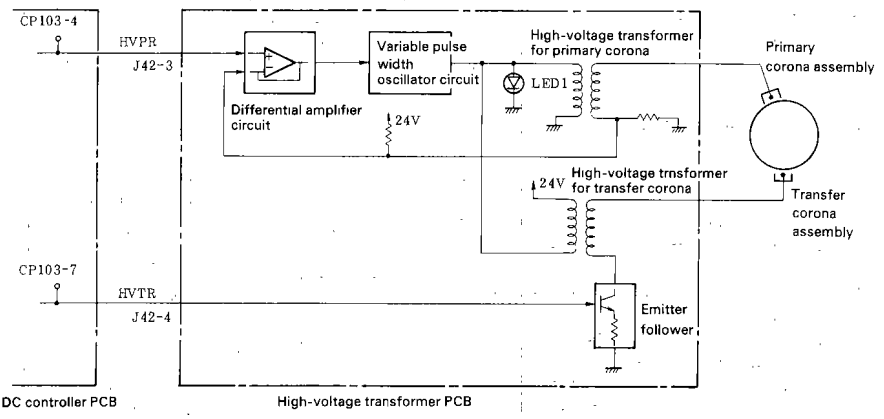

Figure 4-14 Control circuit for primary/transfer corona current

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4. Control of separation/pre-transfer corona current

a. Outline

The circuit shown in Figure 4-15 controls the separation corona current and the pre-transfer corona current. It has the following main functions.

- Switches the separation/pre-transfer current ON/OFF.
- Maintains constant separation/pre-transfer corona current.
- Switches magnitude of separation corona current.

The separation and pre-transfer corona currents are maintained constant in the same way as described for primary corona.

The following signals are output from the DC controller PCB to control the ON/OFF switching of the separation/pre-transfer corona current and the switching of the magnitude of the separation corona current.

- HVSP (SEPARATION CORONA CURRENT CONTROL command)
- HVPT (PRE-TRANSFER CORONA CURRENT CONTROL command)
- HVAC (AC TRANSFORMER DRIVE command)

b. Operation

The two differential amplifier circuits shown in Figure 4-15 operate when HVSP and HVPT are 16V or less.

1) When the separation/pre-transfer high voltage output is ON.

HVSP is approximately 11.6V and HVPT is approximately 10.7V.

└ Differential amplifier circuit "ON"
  └ Variable pulse width oscillator circuit "ON"
    ├ High-voltage transformer (DC output) for separation corona "ON"
    └ High-voltage transformer (DC output) for pre-transfer corona "ON"

These DC voltages are output to the AC transformer. When $\overline{HVAC}$ is "0", the high-voltage AC transformer is ON, and the DC and AC components are output together from the AC transformer.

- HVSP is approximately 10V for the second copying operation during overlay or two-sided copying.
- HVPT is approximately 19V for color copying, so the high-voltage transformer (DC output) is OFF, and only the AC component is output from the AC transformer to the pre-transfer corona assembly.

2) When the separation/pre-transfer high voltage output is OFF, HVSP is approximately 17V and HVPT is approximately 19V.

└ Differential amplifier circuit "OFF"
  └ Variable pulse width oscillator circuit "OFF"
    ├ High-voltage transformer for separation corona "OFF"
    └ High-voltage transformer for pre-transfer corona "OFF"

When $\overline{HVAC}$ is "1", and the high-voltage AC transformer is "OFF.

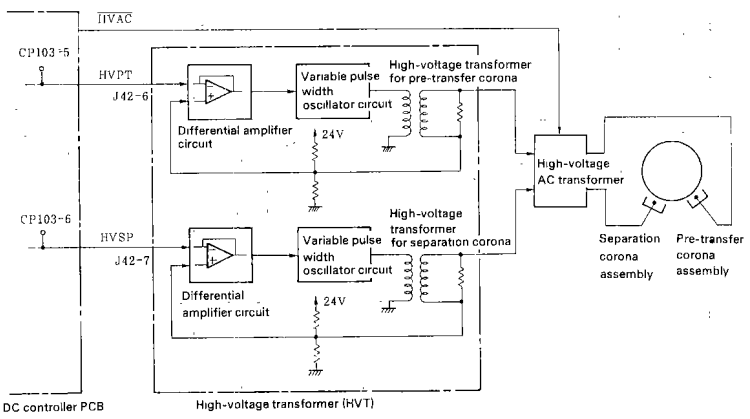

Figure 4-15 Control circuit for separation/pre-transfer corona current

c. Check points

Checking voltage at CP103-5 (DC controller PCB)

- The voltage between CP103-5 (HVPT) and GND is approximately 10.7V during copying and 19V during STANDBY.
- Checking voltage at CP103-6 (DC controller PCB)

The voltage between CP103-6 (HVSP) and GND is approximately 11.6V during first-side copying, 10V during second-side copying, and 17V during STANDBY.

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5. Developing bias control circuit

a. Outline

The circuit shown in Figure 4-16 controls the developing bias. It has the following functions:

- Switches the AC component of the developing bias ON/OFF
- Switches the DC component of the developing bias ON/OFF
- Controls the voltage level of the DC component of the developing bias

The following two signals are output from the DC controller to control these functions.

- $\overline{\text{HVBAC}}$ (AC DEVELOPING BIAS DRIVE command)
- HVBDC (DC DEVELOPING BIAS CONTROL command)

b. Operation

1) Switching AC bias ON/OFF
   - When $\overline{\text{HVBAC}}$ = "1"
     - Pulse generator circuit "OFF"
       - AC high-voltage transformer "OFF"

   This prevents the AC bias from being applied to the developing cylinder
   - When $\overline{\text{HVBAC}}$ = "0"
     - Pulse generator circuit "ON"
       - AC high-voltage transformer "ON"

   This enables the AC bias to be applied to the developing cylinder.

2) Switching DC bias ON/OFF and controlling the DC bias voltage level

   The differential amplifier circuit, shown in Figure 4-16, operates when HVBDC is 16V or less.
   - When the DC bias is "OFF"

     HVBDC is approximately 17V.
     - Differential amplifier circuit "OFF"
       - Variable pulse width oscillator circuit "OFF"
       - DC high-voltage transformer "OFF"

     This prevents the DC bias from being applied to the developing cylinder.
   - Wenn the DC bias is "ON"

     HVBDC is in the range from 8 to 16V.
     - Differential amplifier circuit "ON"
       - Variable pulse width oscillator circuit "ON"
       - DC high-voltage transformer "ON"

     This enables the DC bias to be applied to the developing cylinder.

     HVBDC varies in the range from 8 to 16V depending on the setting of the DENSITY RECALIBRATION keys, whether the CD unit is selected or not, and the service mode.

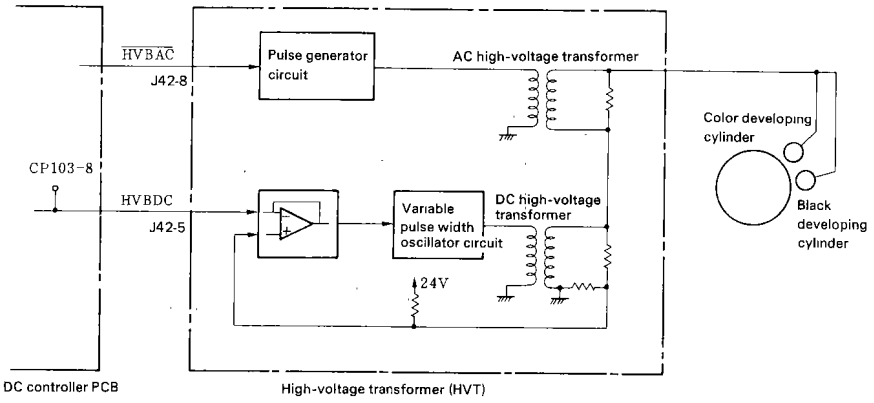

Figure 4-16 Developing bias control circuit

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c. Adjustment

Table 4-3 lists the variables that can be adjusted in service mode for the DC developing bias control circuit

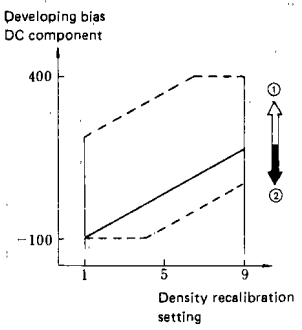
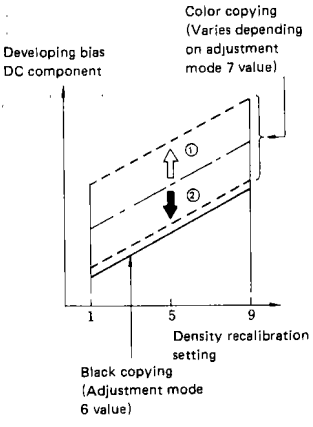
Adjustment method	Function	Adjustment	Remarks
Adjustment mode 6	Developing bias DC component		1 If the value set in service mode is increased → The DC component of the developing bias increases and the copy density decreases 2 If the value set in service mode is decreased → The DC component of the ceveloping bias decreases and the copy density increases
Adjustment mode 7	Difference between developing bias DC component for color copying and black copying		1 If the value set in service mode is increased → The DC component of the developing bias during color copying increases and the color copy becomes fainter. 2 If the value set in service mode is decreased → The DC component of the developing bias decreases and the color copy becomes darker.

Table 4-3

Note: Adjustment mode 6 is normally used when increased V_L (light potential on drum) makes it impossible to compensate for fogging using the DENSITY RECALIBRATION keys. This mode is used after the DENSITY RECALIBRATION keys have been set to the center value.

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6. Blank-exposure lamp control circuit

a. Outline

This circuit controls the blank-exposure lamps, which eliminate charge from the surface of the drum to prevent the attraction of the toner to non-image areas. These lamps operate in response to the cassette being used and the selected reproduction ratio.

On the NP-3725/3525, the blank exposure lamps are also used during the copying operations in binding margin mode, sheet frame erasing mode, two-page separation mode, and color conversion mode.

b. Operation

1) The NP-3725/3525 has 124 LEDs arranged parallel to the axis of the drum. The two LEDs nearest each end of the drum are always lit during drum rotation. The remaining LEDs are arranged electrically in a matrix and are lit according to the cassette being used, selected reproduction ratio, and selected mode.
2) The NP-3225/3025 has three fuse-shaped lamps at the front end of the drum which are always lit during drum rotation except during SCFW, and 39 LEDs at the rear end which are arranged electrically in a matrix and operate according to the cassette being used and the selected reproduction ratio. (See Note)

Note: The NP-3225 has six fuse-ahaped lamps at the front end of the drum.

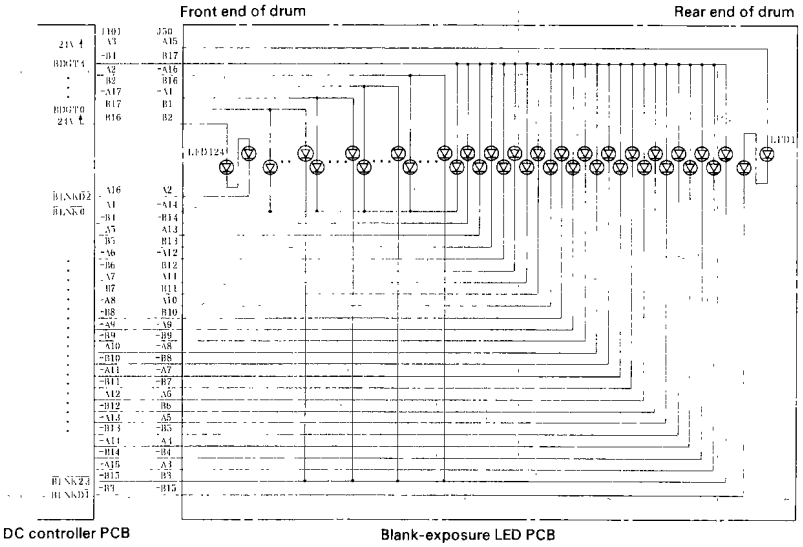

Figure 4-17 Blank exposure lamp (NP-3725/3525)

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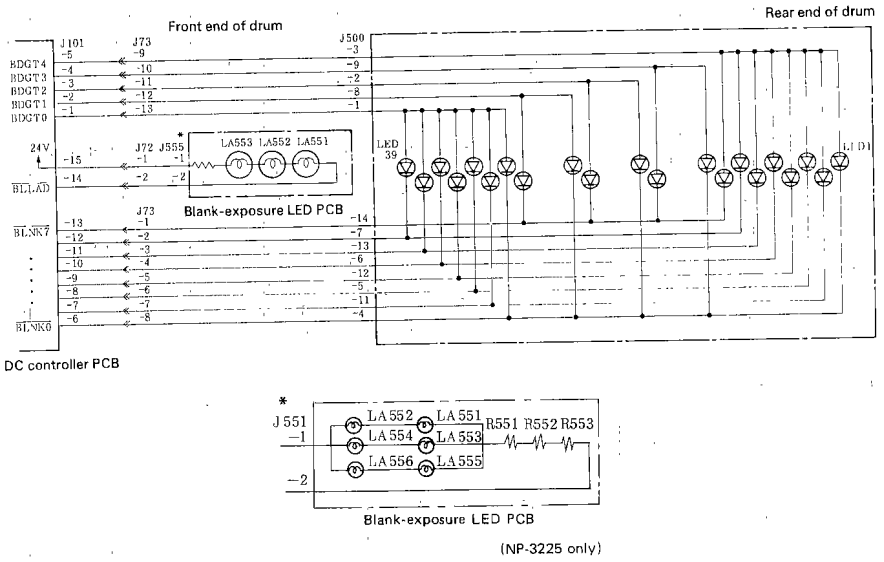

Figure 4-18 Blank exposure lamp (NP-3225/NP-3025)

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B. Motor Control Circuit

1. Outline

The circuit shown in Figure 4-19 controls the main motor and the scanner motor. It has the following functions:

1 Switches main motor ON/OFF
2 Controls speed of main motor
3 Switches scanner motor ON/OFF
4 Controls rotational direction of scanner motor
5 Controls speed of scanner motor

The main motor is controlled to rotate at a constant speed regardless of the reproduction ratio.

The direction of rotation of the scanner motor differs depending on whether the scanner is moving forward or in reverse. When the scanner is moving forward, the motor speed depends on the reproduction ratio. When the scanner is moving in reverse, the motor speed remains constant regardless of the reproduction ratio.

Both motors are DC motors. The voltage applied to the motors is regulated to control their speed. The polarity of the voltage applied to the scanner motor is switched to control the rotational direction of the scanner motor.

Each motor has a built-in clock pulse generator that outputs clock pulses at a frequency that is proportional to the rotational speed. The motor controller PCB uses the clock pulses to control the speed of the motor.

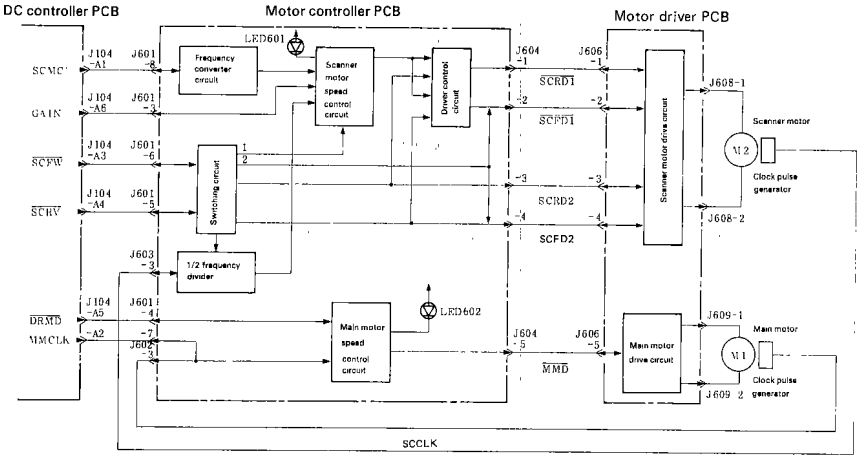

Figure 4-19 Motor control circuit

2. Operation

a. Main motor

When $\overline{DRMD}$ = "1", the main motor speed control circuit does not output the control signal, so the drive circuit remains "OFF". The main motor does not rotate.

When $\overline{DRMD}$ = "0", the control signal is sent from the speed control circuit to turn the drive circuit "ON", and the main motor rotates.

The main motor speed control circuit has a crystal oscillator. The output of the oscillator is divided and used as a reference signal, which is compared to the clock pulse (MMCLK) from the clock pulse generator of the main motor. If there is any difference between the two, a control signal is output to the drive circuit. The drive circuit then drives the motor to correct the speed (and thus clock pulse) so that the motor is maintained at a constant speed.

The driver circuit controls the power supply to the motor, in response to the control signal. Thus a constant speed is maintained regardless of the load.

b. Scanner motor

(1) ON/OFF switching and control of rotational direction

The two signals $\overline{SCFW}$ and $\overline{SCRV}$ are output from the DC controller PCB to control the scanner motor ON/OFF switching and rotational direction.

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· Motor stationary

The DC controller outputs $\overline{SCFW}$ = "1" and $\overline{SCRV}$ = "1".

$\overline{SCFW}$ = "1"

$\overline{SCRV}$ = "1"

→ Output of switching circuit (1) is "1"

→ Scanner motor speed control circuit is "OFF"

Output of the switching circuit:

→ SCFD2 = "0" Output of the

SCRD2 = "0" switching circuit

$\overline{SCFD1}$ = "1" Output of the

$\overline{SCRD1}$ = "1" driver control circuit

This causes the scanner motor drive circuit to go "OFF".

· Scanner forward

The DC controller outputs $\overline{SCFW}$ = "0" and $\overline{SCRV}$ = "1".

$\overline{SCFW}$ = "0"

$\overline{SCRV}$ = "1"

→ Switching circuit output (1) is "0"

→ Scanner motor speed control circuit is "ON"

→ SCFD2 = "1" Output of the

SCRD2 = "0" switching circuit

SCFD1 = "0" Output of the

SCRD1 = "1" driver control circuit

The value of $\overline{SCFD1}$ output from the motor controller PCB is controlled by the scanner motor speed control circuit. When $\overline{SCFD1}$ is "0", the scanner motor drive circuit drives the scanner motor in the direction to move the scanner forward.

Scanner reverse

The DC controller PCB outputs $\overline{SCFW}$ = "1" and $\overline{SCRV}$ = "0".

$\overline{SCFW}$ = "1"

$\overline{SCRV}$ = "0"

→ Switching circuit output (1) is "0"

→ Scanner motor speed control circuit is "OFF"

→ SCFD2 = "0" Output of the

→ SCRD2 = "1" switching circuit

$\overline{SCFD1}$ = "1" Output of the

$\overline{SCRD1}$ = "0" driver control circuit

The value of $\overline{SCRD1}$ output from the motor controller PCB is controlled by the scanner motor speed control circuit. When $\overline{SCRD1}$ is "0", the scanner motor drive circuit drives the scanner motor in the direction to move the scanner in reverse.

· Brake circuit

If the scanner HOME position sensor goes "ON" when the scanner is moving in reverse, the DC controller outputs $\overline{SCFW}$ = "0" and $\overline{SCRV}$ = "0".

$\overline{SCFW}$ = "0"

$\overline{SCRV}$ = "0"

→ Switching circuit output (1) is "1"

→ Scanner motor speed control circuit is "OFF"

→ Switching circuit output (2) makes $\overline{SCFD1}$ = "0" and SCFD2 = "1".

This causes the scananing motor drive circuit to rotate the scanning motor in the opposite direction (forward), which brakes the scanning motor.

(2) Motor speed

The microprocessor on the DC controller outputs pulses (SCMC) at a frequency that depends on the reproduction ratio. (The frequency is in the range from 450 to 1100 Hz.) SCMC, the SCANNER MOTOR SPEED CONTROL signal, is converted to a frequency in the range from 1 to 3 MHz by the frequency converter circuit. (See Note 3)

The scanner motor speed control circuit uses the converted signal as a reference signal which is compared to the SCANNER MOTOR CLOCK PULSE signal (SCCLK). The circuit tries to keep SCCLK equal to the reference signal.

Therefore, the scanner motor speed control circuit varies the speed of the motor to keep SCCLK equal to the reference signal.

During SCANNER FORWARD, the SCANNER MOTOR CLOCK PULSE signal (SCCLK) goes to the scanner motor speed control circuit through the 1/2 frequency divider circuit as its original frequency, and during SCANNER REVERSE, the frequency of SCCLK is divided by 2 in the 1/2 frequency divider circuit, then goes to the scanner motor speed control circuit. The frequency of SCMC during SCANNER REVERSE is 1.5 times its FORWARD frequency in DIRECT mode. Thus, the scanner reverse speed is three times its forward speed in DIRECT mode.

Note:

1. LEDs
   When the main motor is operating at its correct speed, LED 602 lights. When the scanner motor is operating at its correct speed, LED 601 lights.
2. SCANNER MOTOR SPEED CONTROL CIRCUIT OUTPUT SWITCHING signal (GAIN)
   This signal is either "0" and "1", depending on the reproduction ratio, to select one of the two output levels of the scanner motor speed control circuit.
3. The NP-3725/3225 outputs
   Pulses (SCMC) at a frequency in the range from 357 to 1100 Hz

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C. Image Editing Unit Read Circuit

1. Outline

The image editing unit consists of a pair of flat resistor elements and a stylus that contains a switch. The image editing unit is used to read the X and Y coordinates of positions on the copy into the copier memory.

Flat resistor elements are located under the sheet where the original is laid, under the area memory keys (used to store coordinates for areas 1, 2 and 3) and under the keys for the six color conversion modes. The DC controller reads a position set by the stylus as the value for an area setting or as an operating signal from one of the above keys

2. Operation

When the stylus switch SW951 is "ON", the DC controller makes the XY SELECTION signal ($\overline{DGXYS}$) "0" for approximately 10 ms.

When $\overline{DGXYS}$ is "0", relay K901 goes "ON" and the operation of the circuit shown in Figure 4-20 can be represented by Figure 4-21. The voltage at X2 will be input to the DC controller PCB.

When $\overline{DGXYS}$ is "1", K901 goes "OFF" and the operation of the circuit shown in Figure 4-20 can be represented by Figure 4-22. The voltage at Y2 will be input to the DC controller PCB.

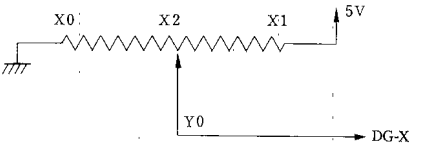

Figure 4-21 X2 read-in

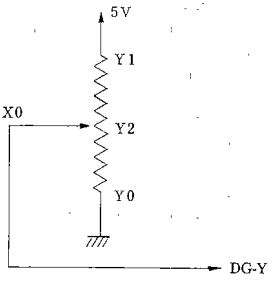

Figure 4-22 Y2 read-in

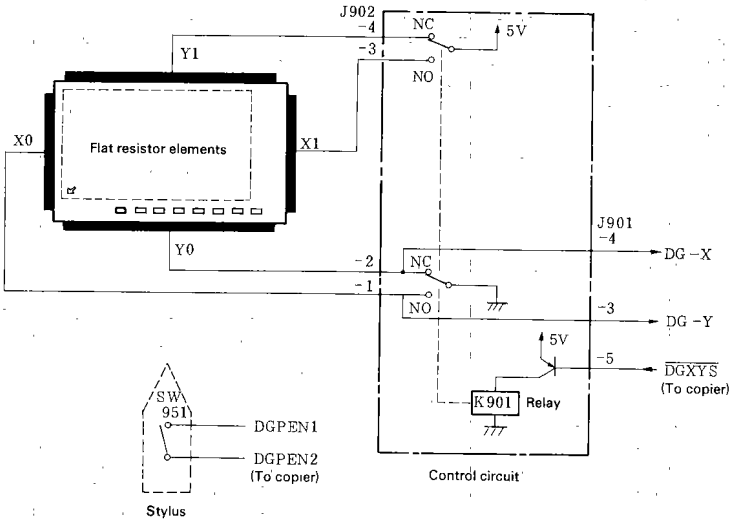

Figure 4-20 Image editing unit read circuit

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Note: Analog data from the image editing unit is converted into data that will indicate the appropriate area on the document. This is described below.

The analog voltages input from the image editing unit, in the range from 0 to 5V, are converted to digital values in the range from 0 to 255 by the A/D conversion circuit in DC controller microprocessor Q101. The CPU uses two stored reference values (Zero-X and Zero-Y) to determine if the digital values (0 to 255) are key inputs or area settings. If the digital values are determined to be area settings, four stored reference values (Span-X, Zero-X, Span-Y, Zero-Y) are used to convert the values to millimeters. A selected point on the image editing unit will have two coordinates (X, Y), with each coordinate represented by and A/D conversion value.

a. Key inputs

The CPU compares the Y value to Zero-Y, and if it is less than Zero-Y, the CPU determines that the coordinate pair is a key input. The value of X is then used to determine which key it is. In Figure 4-24, (X1, Y1) is the A/D conversion value and is a key input.

b. Area settings

The CPU compares the Y value to Zero-Y, and if it is greater than Zero-Y, the CPU determines that the coordinate pair is an area setting. In Figure 4-24, (X2, Y2) is the A/D conversion value and is an area setting. The following formula is used to convert the coordinates to millimeters:

$$\frac{432}{\text{SPAN-X}} \times (\text{X2} - \text{ZERO-X}) = \text{X coordinate in mm.}$$

$$\frac{297}{\text{SPAN-Y}} \times (\text{Y2} - \text{ZERO-Y}) = \text{Y coordinate in mm.}$$

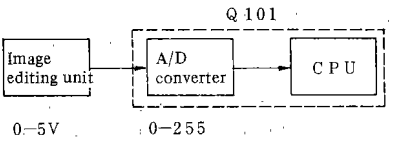

Figure 4-23

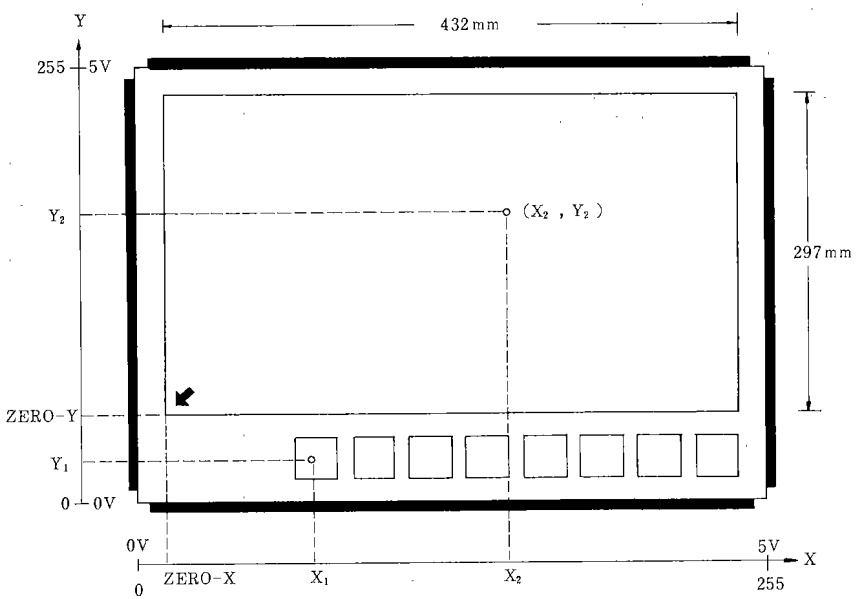

Figure 4-24

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D. Duplexing Unit Control Circuit

1. Outline

The control circuit of the duplexing unit controls all of the motors and solenoids and is commanded by the microprocessor on the DC controller of the copier.

Operation of the switch circuit shown in Figure 4-24a is set out in Table 3-12b.

HTMSTB: 24V during movement of the cross-alignment guide; 5V at OFF

HTMA, HTMA, HTMB, HTMB:
"1" and "0" repeating, during movement of the cross-alignment guide

2. VR 1 Adjustment

When either the driver PCB or paper sensors (P12) of the duplexing unit are replaced in-service, adjust the VR 1 of the duplexing unit driver PCB in accordance with the steps set out below.

1) Raise the copyboard cover of the copier and make one black copy.
2) After switching off the power of the copier, remove the duplexing unit. (please refer to page 5-55)

   Note: Attach the solid black copy firmly to the paper sensor area of the duplexing unit.

3) Set the black copy in the tray of the duplexing unit.
4) Turn the power switch on.
5) Rotate VR1 to cause lifting of LED 1 of the duplexing unit driver PCB.

   Note: Do not renove the linkage cable connecting duplexing unit to the copier.

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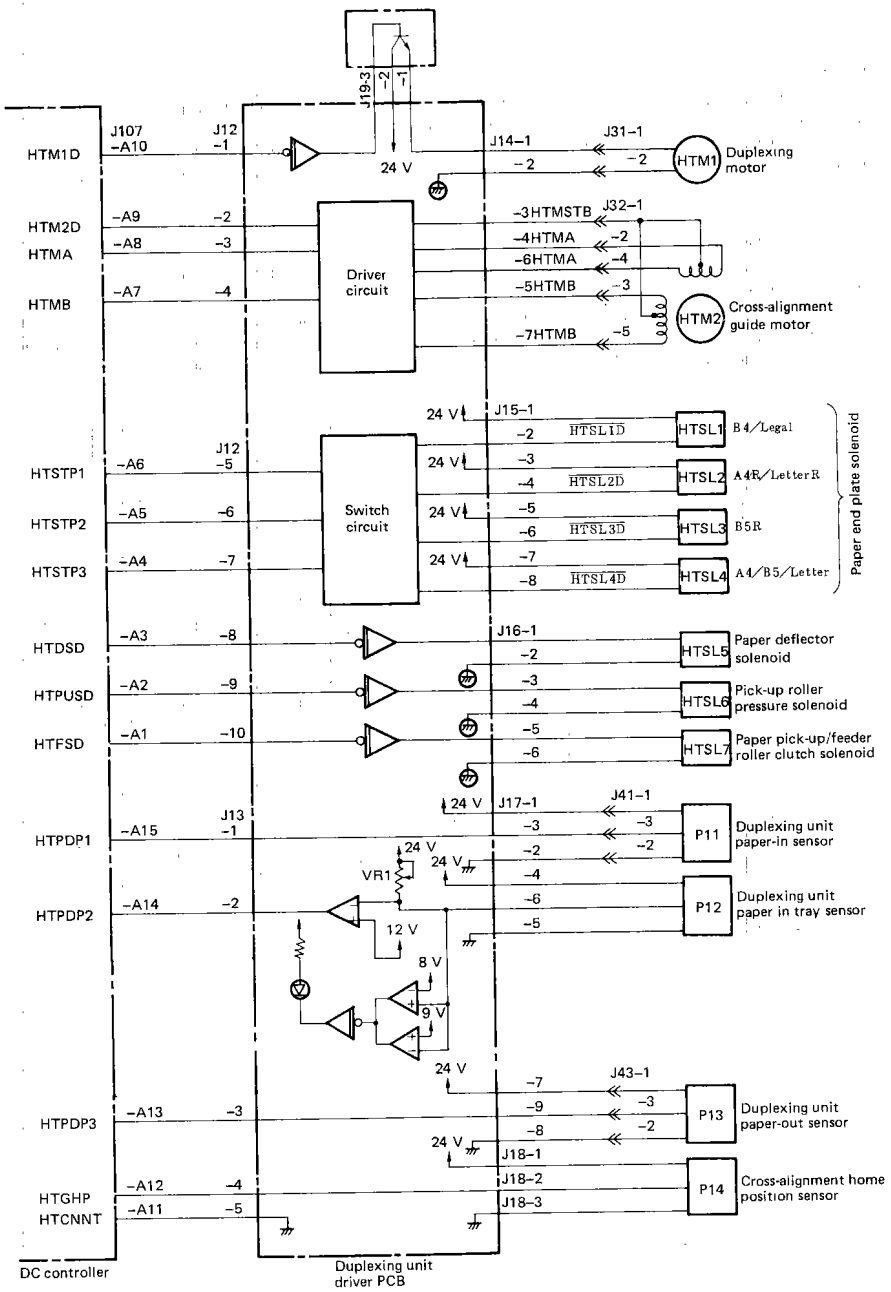

Figure 4-24a

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V. POWER SUPPLIES

A. Power supplies

When the door switch and the power switch of the copier are ON, line voltage is supplied to the DC power supply and other components. The DC power supply outputs 24VDC, 12VDC, and 5VDC.

When the door switch or power switch is OFF, the DC power supply to the DC controller PCB is cut off. Lithium batteries are provided as backup to prevent the contents of RAM on the DC controller PCB from being lost.

B. Power supply circuit protection

The DC power supply circuit is a switching regulator type. Circuit breakers protect against overcurrent in the event of an abnormally high load.

If the protection circuit operates to stop power supply output, remove the plug from the outlet or open the front door to turn the door switch OFF. Fix the cause of the problem and restore power to the copier. If the protection circuit operates again and power is turned OFF and ON several times, the fuse in the DC power supply may blow.

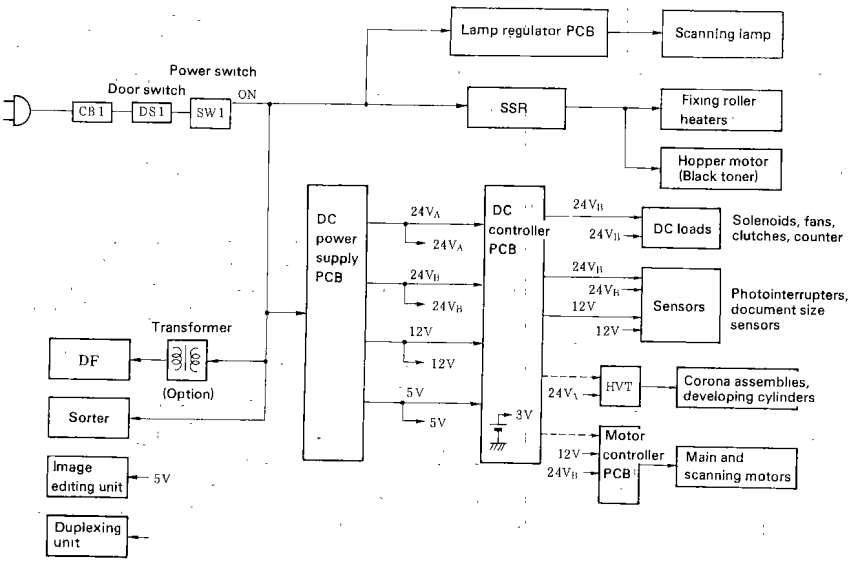

Figure 4-25

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VI. LIST OF PCBs/VRs/LEDs/CHECK PINS

Variable resistors, LEDs and check pins which are used for adjustments in the field are listed below.

VRs and check pins not listed here are used only for factory adjustments which require special tools and measuring instruments as well as great care and precision. Do not attempt to adjust such parts.

Note:

1. Leakage current may flow through some LEDs and cause them to glow dimly even though they are supposed to be OFF.
2. VRs adjustable in the field ..... ⊘
   VRs which should not be adjusted in the field. ..... ⊘

A. DC Controller

NP-3725/3525

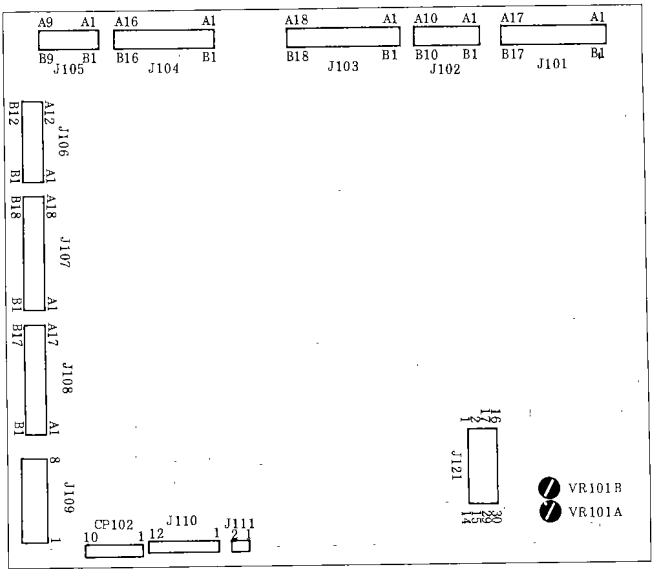

Figure 4-26

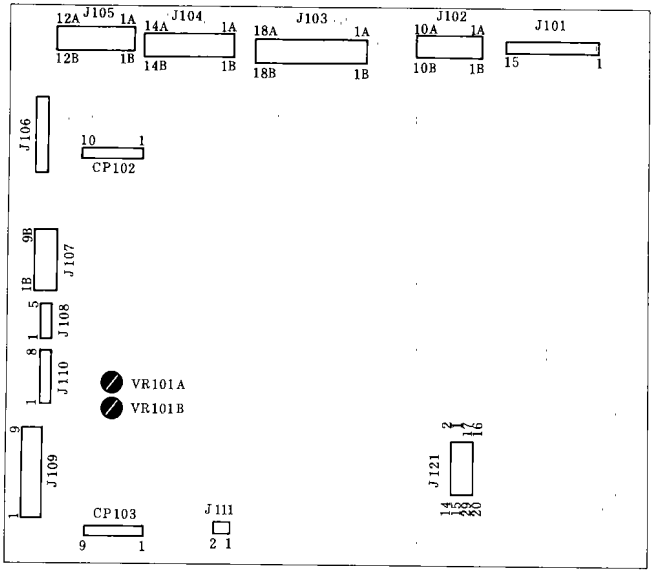

Figure 4-27

Circuit	VR No.	Adjustment	
DC controller PCB	VR101A	Gross adjustment of automatic density control reference point	Refer to page 4-15 for a description of the adjustment method.
	VR101B	Fine adjustment of automatic density control reference pooint	

Table 4-4

DC controller

Circuit	Check pin number	Check	Circuit	Check pin number	Check
DC controller PCB	CP101-30	GND	DC controller PCB	CP103-2	+7.8V
	CP101-36	+24VA		CP103-3	+13.5V
	CP101-37	+24V		CP103-4	HVPR
	CP101-38	+12V		CP103-5	HVPT
	CP101-39	+5V		CP103-6	HVSP
	CP101-40	GND		CP103-7	HVTR
				CP103-8	HVBDC
				CP103-9	LINT

Table 4-5

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B. Color Toner Level Detection PCB

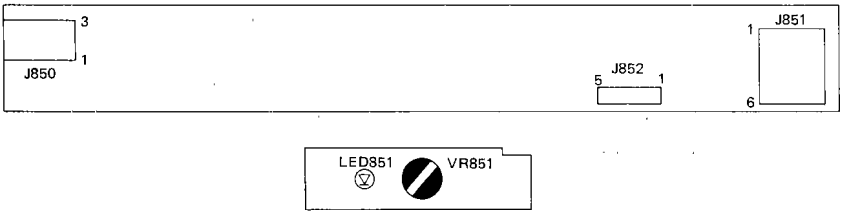

Figure 4-28

Circuit	VR No.	Adjustment
Color toner level detection PCB	VR851	Gain adjustment for color toner sensor (Only performed when the CD unit is installed. Refer to page 6-7.)

Table 4-6

Circuit	LED No.	Indication
Color toner level detection PCB	LED851	Used when adjusting VR851.

Table 4-7

C. Service Mode PCB

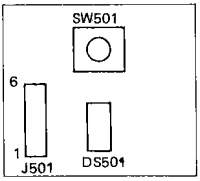

Figure 4-29

Circuit	Switch No.	Function
Service mode PCB	SW501	Push this switch to enter the service mode.

Table 4-8

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D. HVT

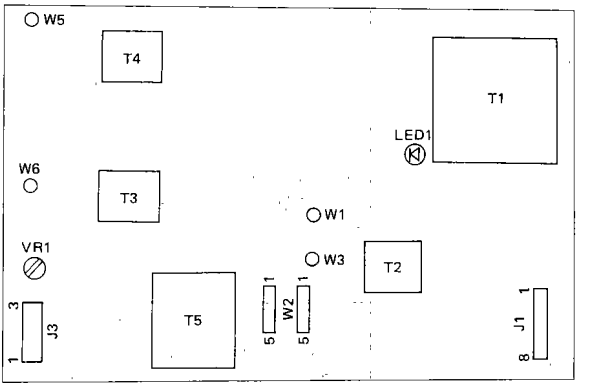

Figure 4-30

Circuit	LED No.	Indication
HVT	LED1	Lights when primary corona voltage is being generated.

Table 4-9

E. Motor controller PCB

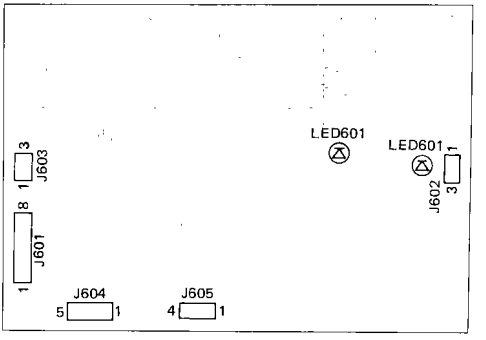

Figure 4-31

Circuit	LED No.	Indication
Motor controller PCB	LED601	Lights when the scanner motor is rotating at the specified speed.
	LED602	Lights when the main motor is rotating at the specified speed.

Table 4-10

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VII. SERVICE MODE

The service mode of the copier consists of the following separate modes:

- Adjustment mode
- I/O display mode
- Fixing assembly temperature display mode
- Operating/check mode

Service mode can be entered only under the following conditions: the front door is open, the counter cover is removed, the door switch actuating tool is actuating the door switch, and the WAIT indicator is green.

A. Adjustment Mode

In adjustment mode, values specified on the control panel are read into the RAM of the DC controller. The adjustments in this mode are identical to the previous method of adjustment using VRs.

Figure 4-32 shows the label that is affixed to the inside of the front door. All copiers are adjusted individually at the factory, and the adjustment values that were set for a copier are written down on this label. If the DC controller is replaced, the standard reference values must be changed back to the adjustment values listed on the label. If another service operation changes the values, they should be recorded on the label.

Standard reference values

Adjustment values that were set for the individual copier at the factory

No.	NAME	TYP	ADJ		
0	AE	100			
1	REG	100			
2	LEB	100			
3	F5	630			
4	F0.5 (<F6)	7			
5	F0.5 (>F6)	14			
6	B	180			
7	△B	50			
8	TI	270			
9	TII	210			
10	SI	90			
11	SII	80			
12			15		
13			16		
14					

Figure 4-32

2. Adjstment procedure

1) Press switch SW501 on the service mode PCB.
   This enables service mode. 00 is displayed on the COPY NUMBER display.
2) Press the ASTERISK key (*) on the control panel.
   This enables adjustment mode. 0 is displayed on the COPY NUMBER display, and the value for the AE slope shown in Table 4-11 (first item) is displayed on the REPRODUCTION RATIO/AREA SET display.
3) Use the VARIABLE REPRODUCTION RATIO keys (V, Λ) or the input keyboard to display the desired new value on the REPRODUCTION RATIO/AREA SET display.
4) Press the asterisk key (*) to store the displayed value.
   The value of the next item in Table 4-11 is then displayed for alteration.
   If step 3) is not performed, the new value will not be stored and the old value will be retained.
5) Follow this procedure to store new values for the subsequent items.
6) Press the R key.
   This cancels service mode.

Note:

1. The values shown in Table 4-11 area called the standard reference values. If the DC controller is replaced, the factory-set values (adjustment values), which are written on the label reproduced in Figure 4-32, must be input again.
2. Only the factory-set value can be entered for items 8, 9, 10, 11
3. Item 6, the DC component of the developing bias, must be adjusted after changing to the center setting of the DENSITY RECALIBRATION keys.
4. The COPY NUMBER display changes as follows when pressing the ASTERISK key (*):
   00, 0, 1, 2, ..., 15, 16, 00, 0, 1, 2, ...
   Copying can be performed in this mode only when 00 is displayed on the COPY NUMBER display.

Example: Adjusting item 3 (normal exposure intensity adjustment)

① Press the A key to cancel the AE mode, and set the copy density to 5.
② Press SW501.
③ Press the ASTERISK key (*) four times, and confirm that 3 is displayed on the COPY NUMBER dispaly.
④ Input the new value.
⑤ Press the ASTERISK key (*) fourteen times, and confirm that 00 is displayed on the COPY NUMBER display.
⑥ Press the COPY START key.
⑦ Repeat steps 3 through 6 until the copy image is good.
⑧ Press the R key.

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COPY NUMBER display	Meaning	REPRO-DUCTION RATIO/AREA SET display	Remarks
0	AE slope	100	As the value is increased, a newsprint copy becomes lighter for copies made in automatic density control mode. (Refer to page 4-15.)
1	Registration (leading edge)	100	If the value is increased by 1, the copy paper lags by 0.5 mm.
2	Leading edge non-reproduced area	100	For NP-3725/3525 If the value is decreased by 1, the leading edge non-reproduced area increases by 0.5 mm. For NP-3225/3025 If the value is decreased by 1, the leading edge non-reproduced area increases by 0.5 mm for the second page during two page separation copying.
3	Adjustment for optimum exposure intensity	630	If the value is increased, the intensity of the scanning lamp is increased. (Refer to page 4-14.)
4	Slope for copy densities under 6	007	If the value is increased, the scanning lamp intensity decreases for copies with densities between 1 and 6. (Refer to page 4-14.)
5	Slope for copy densities over 6	014	If the value is increased, the scanning lamp intensity increases for copies with densities between 6 and 9. (Refer to page 4-14.)
6	DC component of developing bias	180	If the value is increased, the DC component of the developing bias increases. (The copy becomes lighter.) (Refer to page 4-19.)
7	Difference between DC component of developing bias for color copying and black copying	050	If the value is increased, the DC component of the developing bias for color copying increases. (The copy becomes lighter.) (Refer to page 4-19.)
8	Transfer corona current (1st copy) (for factory use)	270	If the value is increased, the transfer corona current increases.
9	Transfer corona current (2nd copy) (for factory use)	210	If the value is increased, the transfer corona current increases for the second copying operation of two-sided or overlay copying.
10	Separation corona current (1st copy) (for factory use)	090	If the value is increased, the separation corona current increases.
11	Separation current (2nd copy) (for factory use)	080	If the value is increased, the separation corona current increases for the second copying operation of two-sided or overlay copying.
12	Image editing unit (Span-X)	242	If this value is increased, the number of mm calculated from the origin (along the X axis) will be less. (Refer to page 4-23.)
13	Image editing unit (Zero-X)	007	If this value is increased, the number of mm calculated from the origin (along the X axis) will be less. (Refer to page 4-23.)
14	Image editing unit (Span-Y)	230	As this value is increased, the number of mm calculated from the origin (along the Y axis) will be less. (Refer to page 4-23.)

Table 4-11 Adjustment Mode Chart

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COPY NUMBER display	Meaning	REPRO-DUCTION/ RATIO AREA SET display	Remarks
15	Image editing unit (Zero-Y)	015	As this value is increased, the number of mm calculated from the origin (along the Y axis) will be less. (Refer to page 4-23.)
16	Time required to return to STANDARD mode	002	Unit: minutes (If 0 is specified, return to STANDARD mode does not function.)

Table 4-11 (continued)

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B. I/O Display Mode

1. Outline

In I/O display mode, the "1" and "0" values of the I/O signals of the microprocessor in the DC controller (shown in Table 4-12, 13) are indicated by the A indicator.

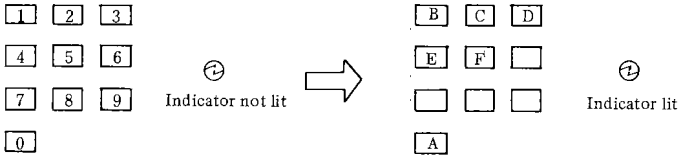
A indicator 1: Lit 0: Not lit

This mode is used to determine whether the sensors are functioning correctly. Copying can also be performed in this mode.

2. Procedure

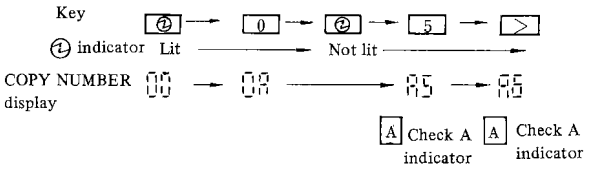
To check the I/O signals transmitted during copying, the copier must be in copy mode. The reproduction ratio cannot be set, and remains at 115% during the test. (121% for 115V copiers.)

1) Press switch SW501 on the service mode PCB.
   This enables service mode. 00 is displayed on the COPY NUMBER display.
2) Press the enlargement key, and select B4 → A3 B5 → A4 (LGL → 11 x 17).
   This enables I/O display mode.
3) Use the INPUT keyboard or the MANUAL DENSITY CONTROL keys (<, >) to display the I/O address (to be checked) on the COPY NUMBER display. (Refer to Tables 4-12 and 13.) Check the A indicator.
   The input keyboard is used to input values from 0 to F. When the ⓐ indicator is lit, pressing the keys from 0 to 5 will cause the corresponding character (A to F) to be displayed.



Press the < MANUAL DENSITY CONTROL key to decrease the address number displayed on the copy number display, and the > key to increase the address value.

Example: To check the scanner home position sensor (address A5) and the scanner at document edge sensor (address A6), press the keys as follows:



4) To check the I/O signals transmitted during copying, press the COPY START key.
5) Press the R key.
   This cancels service mode.

Note:
The lighting of the A indicator as described in Tables 4-12 and 4-13 does not always correspond to the actual logic level of the device being checked.

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1 = Lit, 0 = Not lit

Input/ Output	Item checked	Address	Signal name	Connector No.	Remarks
Input	Control counter detection sensor	A0	$\overline{\text{CCNTDT}}$	J105-B1	0: Control counter/card connected
	Total counter detection sensor	A1	$\overline{\text{TCNTDT}}$	–	0: Total counter connected
	Scanning lamp lit sensor	A2	LAON	J103-A17	1: Scanning lamp lit
	–	A3	–	–	Not used
	Black developing unit toner level sensor	A4	$\overline{\text{BTEP}}$	J105-A9	0: Toner level below reference level
	Scanner home position sensor	A5	SCHP	J104-B12	1: Scanner at home position
	Scanner at document leading edge sensor	A6	SCDP	J104-B13	1: Signal-generating plate at Q12
	Scanner reverse position sensor	A7	SCBP	J104-B14	1: Signal-generating plate at Q13
Output	Main motor	A8	$\overline{\text{DRMD}}$	J104-A5	1: Main motor ON
	Scanner motor forward rotation	A9	$\overline{\text{SCFW}}$	J104-A3	1: For scanner motor forward rotation
	Scanner motor reverse rotation	AA	$\overline{\text{SCRV}}$	J104-A4	1: For scanner motor reverse rotation
	Scanner motor rotational speed	AB	GAIN	J104-A6	0: For reproduction ratios of 64 to 104% (NP-3525 only) 1: For reproduction ratios of 105 to 156% (NP-3525 only) 0: For reproduction ratios of 64 to 119% (NP-3725 only) 1: For reproduction ratios of 120 to 200% (NP-3725 only)
	Scanning lamp ON/OFF	AC	$\overline{\text{LRD}}$	J103-A16	1: Scanner lamp LA1 ON
	Primary/transfer corona high voltage output	AD	HVT	–	1: Primary/transfer corona high voltage output ON
	Developing bias AC component output	AE	HVBAC	–	1: Developing bias AC component ON
	Pre-transfer/separation corona high voltage output	AF	HVAC	–	1: Pre-transfer/separation corona high voltage output ON
Output	Total counter	B0	$\overline{\text{TCNTD}}$	J105-B3	1: Total counter ON
	–	B1	–	–	Not used
	Black developing unit release clutch solenoid	B2	$\overline{\text{BDRSD}}$	J104-B7	1: SL1 ON
	CD unit engage clutch solenoid	B3	$\overline{\text{CDPSD}}$	J104-B8	1: SL2 ON
	Image editing unit buzzer	B4	$\overline{\text{DGBZ}}$	J107-A12	1: Image editing unit buzzer ON
	Cleaning belt drive solenoid	B5	$\overline{\text{CLBSD}}$	J104-A11	1: SL4 ON
	Registration roller 1 clutch solenoid	B6	$\overline{\text{RGSD1}}$	J107-B13	1: SL6 ON
	Multifeeder paper supply plate clutch	B7	$\overline{\text{MFLCD}}$	J108-A16	1: CL5 ON

Table 4-12

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1 = Lit, 0 = Not lit

Input/ Output	Item checked	Address	Signal name	Connector No.	Remarks
Input	Document size sensor 1	B8	OSZ1	J106-B2	1: Document detected
	Document size sensor 2	B9	OSZ2	J106-B3	1: Document detected
	Document size sensor 3	BA	OSZ3	J106-B5	1: Document detected
	CD unit color toner level sensor	BB	CTEP	J104-A15	1: Toner level below reference level
Input	Toner color signal 1	BC	CDMS1	J104-A14	See table below.
	Toner color signal 2	BD	CDMS2	J104-A13	
	Toner color signal 3	D4	CDMS3	J104-A12	
	Copyboard cover opened/ closed sensor	BE	$\overline{\text{CBCC}}$	J104-A10	0: Copyboard cover closed
	Lens home position detector	BF	LHP	J106-A7	1: Lens at home position
Output	Image editing unit LED1	C0	$\overline{\text{DGLED1}}$	J110-4	1: LED1 ON
	Image editing unit LED2	C1	$\overline{\text{DGLED2}}$	J110-5	1: LED2 ON
	Image editing unit LED3	C2	$\overline{\text{DGLED3}}$	J110-6	1: LED3 ON
	Image editing unit XY slope signal	C3	$\overline{\text{DGXYS}}$	J110-3	1: When pen switch is pressed (for approx. 10 ms)
	Hopper motor	C4	$\overline{\text{HMD}}$	J103-B14	1: Hopper motor (M4) operates
	Exhaust fan	C5	$\overline{\text{EFMD}}$	–	1: Exhaust fan high speed revolution
	Main heater	C6	$\overline{\text{MHTRD}}$	J103-B16	1: Main heater (H1) operates
	Sub heater	C7	$\overline{\text{SHTRD}}$	J103-B15	1: Sub heater (H2) operates
Output	Sorter (20 bin) remote signal	C8	SORTON	J121-22	1: Sorter power supply ON
	Deflector solenoid	C9	$\overline{\text{DPSD}}$	J104-B10	1: SL5 ON
	Holding tray feed roller clutch solenoid	CA	$\overline{\text{DFSD}}$	J104-B14	1: SL7 ON
	Delivery/refeed roller solenoid	CB	$\overline{\text{RVSD}}$	J104-B4	1: SL8 ON
	Cross-ways registration solenoid	CC	$\overline{\text{CRGSD}}$	J107-B15	1: SL10 ON
	Registration roller 2 clutch	CD	$\overline{\text{RGSD2}}$	J107-B11	1: SL9 ON
	Jam relay signal	CE	JAML	–	1: When jam occurs
	Upper cassette size read-in	CF	UCAST	J108-A9	1: Upper cassette read-in

Table 4-12 (continued)

Signal name	Red	Blue	Green	Brown	No CD unit
Toner color signal 1	0	0	0	1	1
Toner color signal 2	0	1	0	0	1
Toner color signal 3	0	0	1	0	1

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1 = Lit 0 = Not lit

Input/ Output	Item checked	Address	Signal name	Connector No.	Remarks
Input	Fixing assembly delivery sensor	D0	$\overline{PDP2}$	J104-B11	0: Copy paper detected by Q14
	Pre-registration paper sensor 1	D1	$\overline{PDP1}$	J107-B8	0: Copy paper detected Q17
	DF connection	D2	$\overline{DFNC}$	J121-29	0: DF is connected.
	Sorter connection	D3	$\overline{SORTNC}$	J121-28	0: Sorter is connected
	Multifeeder tray sensor	D5	$\overline{MFS}$	J108-B16	0: Multifeeder tray is open
	Jam reset	D6	JRST	J105-A7	1: When jam reset button is pressed.
	UL mode	D7	$\overline{ULMD}$	J111-2	0: Copier set for UL specifications (inch paper size)
Output	Duplex unit guide 1	D8	$\overline{HTSTP1}$	J107-A6	See below table.
	Duplex unit guide 2	D9	$\overline{HTSTP2}$	J107-A5	
	Duplex unit guide 3	DA	$\overline{HTSTP3}$	J107-A4	
	Duplex unit deflector solenoid	DB	$\overline{HTDSD}$	J107-A3	1: SL5 ON
	Duplex unit paper feed solenoid	DC	$\overline{HTPUSD}$	J107-A2	1: SL6 ON
	Duplex unit transport solenoid	DD	$\overline{HTFSD}$	J107-A1	1: SL7 ON
	Duplex unit transport motor	DE	$\overline{HTMD}$	J107-A10	1: Duplex unit transport motor M1 ON
	Color toner supply solenoid	DF	$\overline{CTSSD}$	J104-B3	1: SL3 ON
Output	Upper-cassette pick-up roller clutch	E0	$\overline{UPUCD}$	J108-B12	1: CL1 ON
	Lower-cassette pick-up roller clutch	E1	$\overline{LPUCD}$	J108-A10	1: CL2 ON
	Upper-cassette paper lifter clutch	E2	$\overline{ULTCD}$	J108-B10	1: CL3 ON
	Lower-cassette paper lifter clutch	E3	$\overline{LLTCD}$	J108-A14	1: CL4 ON

Table 4-12 (continued)

Paper size	HTSTP3	HTSTP2	HTSTP1	SL1	SL2	SL3	SL4
A	1	1	1	OFF	OFF	OFF	OFF
B5	1	1	0	ON	OFF	OFF	OFF
A4R	1	0	1	OFF	ON	OFF	OFF
B5R	1	0	0	OFF	OFF	ON	OFF
V4/B5	0	1	1	OFF	OFF	OFF	ON

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1 = Lit 0 = Not lit

Input/ Output	Item checked	Address	Signal name	Connector No.	Remarks
	Upper-cassette pick-up roller release solenoid	E4	$\overline{\text{UPRSD}}$	J108-B14	1: SL11 ON
	Lower-cassette pick-up roller release solenoid	E5	$\overline{\text{LPRSD}}$	J108-A12	1: SL12 ON
	–	E6	–	–	Not used
	–	E7	–	–	Not used
Input	Cassette size sensor 0	E8	CSZ0	J108-A7	1: SW704 ON
	Cassette size sensor 1	E9	CSZ1	J108-A6	1: SW703 ON
	Cassette size sensor 2	EA	CSZ2	J108-A5	1: SW702 ON
	Cassette size sensor 3	EB	CSZ3	J108-A4	1: SW701 ON
	Upper cassette paper out sensor	EC	$\overline{\text{UPEP}}$	J108-B2	0: No paper in upper cassette
	Lower cassette paper out sensor	ED	$\overline{\text{LPEP}}$	J108-B8	0: No paper in lower cassette
	Upper cassette paper lifter position sensor	EE	$\overline{\text{ULFTP}}$	J108-A2	0: Upper lifter does not rise
	Lower cassette paper lifter position sensor	FF	$\overline{\text{LLFTP}}$	J108-B5	0: Lower lifter does not rise
	Duplex unit inlet sensor	F0	$\overline{\text{HTPDP1}}$	J107-A15	0: Paper detected by P11
	Duplex unit paper sensor	F1	HTPDP2	J107-A14	1: Paper detected by P12
	Duplex unit outlet paper sensor	F2	$\overline{\text{HTPDP3}}$	J107-A13	0: Paper detected by P13
	Duplex unit guide home position detector	F3	HTGHP	J107-A12	1: Guide at home position
	Duplex unit connection	F4	$\overline{\text{HTCNNT}}$	J107-A11	0: Duplex unit connected to copier
	Cross-ways registration paper edge sensor	F5	PDP4	J107-A17	1: Copy paper detected by Q16
	Pre-registration 2 paper sensor	F6	PDP3	J107-B10	1: Copy paper detected by Q15
	Cross-ways registration cam home position sensor	F7	$\overline{\text{RGHP}}$	J107-B9	0: Registration roller 2 at home position

Table 4-12 (continued)

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NP-3025 Address Table

1 = Lit 0 = Not lit

Input/ Output	Item checked	Address	Signal name	Connector No.	Remarks
Input	Control counter detection sensor	A0	$\overline{\text{CCNTDT}}$	J105-A1	0: Control counter/card connected
	Total counter detection sensor	A1	$\overline{\text{TCNTDT}}$	–	0: Total counter connected
	Scanning lamp lit sensor	A2	LOAN	J103-A17	1: Sanning lamp lit
	–	A3	–	–	Not used
	Black developing unit toner level sensor	A4	$\overline{\text{BTEP}}$	J105-B7	0: Toner level below reference level
	Scanner home position sensor	A5	SCHP	J104-B10	1: Scanner at home position
	Scanner at document leading edge sensor	A6	SCDP	J104-B11	1: Signal generating plate at Q12
	Scanner reverse position sensor	A7	SCBP	J104-B12	1: Signal generating plate at Q13
Output	Main motor	A8	$\overline{\text{DRMD}}$	J104-A5	1: Main motor ON
	Scanner motor forward rotation	A9	$\overline{\text{SCFW}}$	J104-A3	1: For scanner motor forward rotation
	Scanneer motor reverse rotation	AA	$\overline{\text{SCRV}}$	J104-A4	1: For scanner motor reverse rotation
	Scanner motor rotational speed	AB	GAIN	J104-A6	0: For reproduction ratios of 64 to 104% (NP-3025 only) 1: For reproduction ratios of 105 to 156% (NP-3025 only) 0: For reproduction ratios of 64 to 119% (NP-3225 only) 1: For reproduction ratios of 120 to 200% (NP-3225 only)
	Scanning lamp ON/OFF	AC	$\overline{\text{LRD}}$	J103-A16	1: Scanner lamp LA1 ON
	Primary/transfer corona high voltage output	AD	HVT	–	1: Primary/transfer corona high voltage output ON
	Developing bias AC component output	AE	HVBAC	–	1: Developing bias AC component ON
	–	AF	–	–	Not used
Output	Total counter	B0	$\overline{\text{TCNTD}}$	J105-A3	1: Total counter ON
	–	B1	–	–	Not used
	Jam relay signal	B2	JAML	–	1: If paper jam occurs
	Upper cassette size read-in	B3	UCAST	J108-5	1: Upper cassette read-in
	–	B4	–	–	Not used
	Cleaning belt drive solenoid	B5	$\overline{\text{CLBSD}}$	J104-B5	1: SL4 ON
	Registration roller clutch solenoid	B6	$\overline{\text{RGSD}}$	J107-B5	1: SL6 ON
	Sorter (20 bin) remote signal	B7	SORTON	J121-22	1: Sorter power supply ON

Table 4-13

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1 = Lit 0 = Not lit

Input/ Output	Item checked	Address	Signal name	Connector No.	Remarks
Input	Cassette size sensor 0	B8	CSZ0	J108-4	1: SW704 ON
	Cassette size sensor 1	B9	CSZ1	J108-3	1: SW703 ON
	Cassette size sensor 2	BA	CSZ2	J108-2	1: SW702 ON
	Cassette size sensor 3	BB	CSZ3	J108-1	1: SW701 ON
Input	Upper cassette paper out sensor	BC	$\overline{\text{UPEP}}$	J105-A11	0: No paper in upper cassette
	Lower cassette paper out sensor	BD	LPEP	J110-7	1: No paper in lower cassette
	Pre-registration paper sensor	BE	$\overline{\text{PDP1}}$	J107-B8	0: Copy detected by Q17
	Lens home position sensor	BG	LHP	J106-7	1: Lens at home position
Output	Black developing unit release clutch solenoid	C0	$\overline{\text{BDRSD}}$	J104-B3	1: SL1 ON
	CD unit engage clutch solenoid	C1	$\overline{\text{CDPSD}}$	J104-B	1: SL2 ON
	Color toner supply solenoid	C2	$\overline{\text{CTSSD}}$	J104-B6	1: SL3 ON
	–	C3	–	–	Not used
	Hopper motor	C4	$\overline{\text{HMD}}$	J103-B14	1: Hopper motor (M4) operates
	Exhaust fan	C5	$\overline{\text{EFMD}}$	–	1: Exhaust fan high speed revolution
	Main heater	C6	$\overline{\text{MHTRD}}$	J103-B16	1: Main heater (H) operates
	Sub heater	C7	$\overline{\text{SHTRD}}$	J103-B15	1: Sub heater H2 operates
Input	Toner color signal 1	C8	CDMS1	J104-A11	See below Table
	Toner color signal 2	C9	CDMS2	J104-A10	
	Toner color signal 3	CA	CDMS3	J104-A9	
	CD unit toner level sensor	CB	CTEP	J104-A12	1: Toner level below reference level
	–	CC	–	–	Not used
	–	CD	–	–	Not used
	–	CE	–	–	Not used
		CF	–	–	Not used

Table 4-13 (continued)

Signal name	Red	Blue	Green	Brown	No CD unit
Toner color signal 1	0	0	0	1	1
Toner color signal 2	0	1	0	0	1
Toner color signal 3	0	0	1	0	1

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1 = Lit 0 = Not lit

Input/ Output	Item checked	Address	Signal name	Connector No.	Remarks
Input	Fixing assembly delivery sensor	D0	$\overline{PDP2}$	J104-B9	0: Copy paper detected by Q14
	–	D1	–	–	Not used
	DF connection	D2	DFNC	J121-29	1: DF not connected
	Sorter connection	D3	SORTNC	J121-28	1: Sorter not connected
	–	D4	–	–	Not used
	Manual feed sensor	D5	$\overline{MFS}$	J105-A8	0: Manual feed tray is lowered
	Jam reset	D6	JRST	J105-A6	1: Jam reset button ON
	UL mode	D7	$\overline{ULMD}$	J111-2	0: Copier set for UL specifications (inch paper size)
Output	Blank exposure LED ground connection	D8	$\overline{BLNK0}$	J101-6	For lighting of LEDs 1, 9, 17, 25, 33
	Blank exposure LED ground connection	D9	$\overline{BLNK1}$	J101-7	For lighting of LEDs 2, 10, 18, 26, 34
	Blank exposure LED ground connection	DA	$\overline{BLNK2}$	J101-8	For lighting of LEDs 3, 11, 19, 27, 35
	Blank exposure LED ground connection	DB	$\overline{BLNK3}$	J101-9	For lighting of LEDs 6, 14, 22, 30, 38
	Blank exposure LED ground connection	DC	$\overline{BLNK4}$	J101-10	For lighting of LEDs 5, 13, 21, 29, 37
	Blank exposure LED ground connection	DD	$\overline{BLNK5}$	J101-11	For lighting of LEDs, 6, 14, 22, 30, 38
	Blank exposure LED ground connection	DE	$\overline{BLNK6}$	J101-12	For lighting of LEDs 7, 15, 23, 31, 39
	Blank exposure LED ground connection	DF	$\overline{BLNK7}$	J101-13	For lighting of LEDs 8, 16, 24, 32
Output	Upper cassette pick-up roller clutch solenoid	E0	$\overline{UPUSD}$	J107-B1	1: SL13 ON
	Lower cassette pick-up roller clutch solenoid	E1	$\overline{LPUCD}$	J107-B3	1: CL2 ON
	Blank exposure LED power connection	E2	BDGT0	J101-1	For lighting of LEDs 33 to 39 (anode side)
	Blank exposure LED power connection	E3	BDGT1	J101-2	For lighting of LEDs 25 to 32 (anode side)
	Blank exposure LED power connection	E4	BDGT2	J101-3	For lighting of LEDs 17 to 24 (anode side)
	Blank exposure LED power connection	E5	BDGT3	J101-4	For lightng of LEDs 9 to 16 (anode side)

Table 4-13 (continued)

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1 = Lit 0 = Not lit

Input/ Output	Item checked	Address	Signal name	Connector No.	Remarks
Output	Blank expsoure LED power connection	E6	BDGT4	J101-5	For lighting of LEDs 1 to 8 (anode side)
	Blank exposure fuse lamps drive signal	E7	$\overline{\text{BLLAD}}$	J101-14	0: LA551, 552, 553 lit (NP-3025) 0: LA551 ~ LA556 lit (NP-3225)

Table 4-13 (continued)

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C. Fixing Assembly Temperature Display Mode

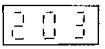
1. Outline

In this mode, the output of the thermistor (TH1) used to detect the surface temperature of the upper fixing roller is converted to a temperature value and displayed in unit of degrees Celsius on the REPRODUCTION RATIO/AREA SET display. Copying can be performed in this mode.

2. Procedure

To check the fixing temperature during copying, the copier must be in copy mode, the reproduction ratio cannot be set, and remains at 86% during the test. (Or at 78% for 115V copiers.)

1) Press switch SW501 on the service mode PCB.
   This enables service mode. 00 is displayed on the COPY NUMBER display.
2) Press the reduction key, and select A3 → B4 A4 → B5 (LGL → LTR).
   This enables fixing assembly temperature display mode.
   0 will be displayed on the COPY NUMBER display, and the fixing assembly temperature (°C) will be displayed on the REPRODUCTION RATIO/AREA SET display.
3) To check the fixing assembly temperature during the copying process, press the COPY START key.
4) Press the R key.
   This cancels service mode.



This indicates 203°C.

REPRODUCTION RATIO/AREA SET display

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D. Operating Check mode

1. Outline

The following special modes are used to operate the copier while performing adjustments and operating checks:

CD unit adjustment mode
Adjustment mode for automatic density control reference point
Drum unit release
All blank exposure lamps lit
All control panel indicators lit

2. Procedure

1) Press switch SW501 on the service mode PCB.
2) Use the MANUAL DENSITY CONTROL keys or the INPUT keyboard to display the number of the desired item on the COPY NUMBER display.
3) Press the COLOR SELECTION key.
   Then follow the procedure described below for each respective item.
4) Press the R key. This cancels service mode.

"01" CD unit adjustment mode

This mode is used when the CD unit is installed. When it is selected, the main motor rotates, the black developing unit is released, and voltage is applied to the CD unit. The starter in the CD unit is stirred for approximately three minutes, and then the CD unit is released and the main motor stops. (Do not use this mode other than when installing the CD unit. Should this mode be entered mistakenly, immediately switch the power (OFF).

For details on the adjustment procedure, refer to Chapter 6, Installation Procedure for CD unit.

"02" Adjustment mode for automatic density control reference point

This mode is used when adjusting VR101A and VR101B on the DC controller.

When it is selected, the scanning lamp lights and the scanner repeatedly scans between its home position and the position at which the automatic density control measurement is made. The output of the AE sensor that was read into microprocessor Q101 on the DC controller is displayed on the REPRODUCTION RATIO/AREA SET display on the control panel.

For details on the adjustment procedure, refer to page 4-15.

"03" Drum unit release

This mode is used when the drum unit or the black developing assembly is removed.

When it is selected, the main motor rotates and the black developing unit and the CD unit are disconnected from the drum unit.

"04" All blank exposure lamps lit

This mode is used to check the blank exposure lamps.

When it is selected, all the blank exposure lamps light. Make sure this operation is carried out after removing the drum unit.

"05" All control panel displays lit

This mode is used to check the LEDs on the control panel.

When it is selected, all the LEDs on the control panel go ON. However, the MULTIFEEDER/MANUAL FEED indicator, CONTROL CARD/COUNTER CHECK indicator, DF/ADF indicator and sorter indicator of the JAM LOCATION indicator and the red colored LED of the WAIT indicator go ON momentarily and then go OFF.

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I. EXTERNALS

A. Covers, Panels, and Doors

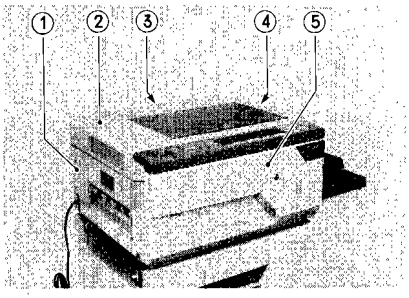

Figure 5-100

① Left rear panel (2)
② Top cover
③ Rear panel (2)
④ Right panel (5)
⑤ Front door

Note:
Numbers in parentheses refer to the number of mounting screws.

When cleaning, checking and repairing the copier, use the following procedures to remove the necessary covers.

Procedures are not described for covers whose removal requires only the removal of the mounting screws.

1. Top cover

1) Remove the copyboard cover.
2) Unscrew the 2 mounting screws and remove the copyboard retainer.
3) Remove the copyboard glass.
4) Remove the standard white plate.
5) Unscrew the mounting screw and remove the magnet plate.

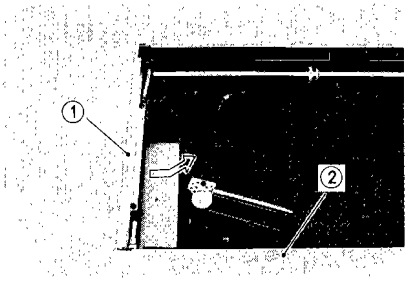

Figure 5-101

① Standard white plate ② Magnet plate

6) Remove the control panel.
7) Remove the rear panel.
8) Grasp the bottom of the left and right bushings, and push them up to remove them.

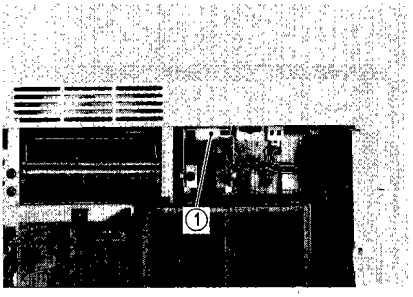

Figure 5-102

① Bushings

9) Unscrew the two mounting screws and remove the top cover.

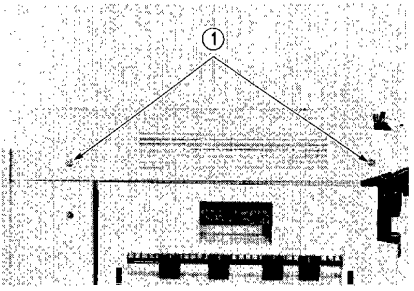

Figure 5-103

① Mounting screws

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2. Front door

1) Unscrew the mounting screw for each front door support strap.
2) Remove the pin of each hinge, and remove the front door.

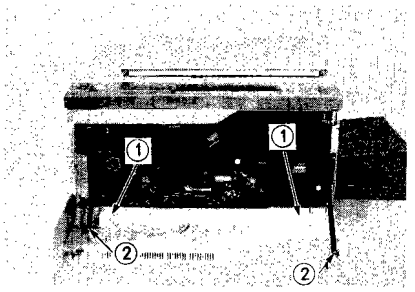

Figure 5-104

① Pin ② Mounting screw

3. Right panel (NP-3225/3025)

1) Push down the manual feed selection lever, and remove the knob (one screw).
2) Unscrew the five mounting screws and remove the right panel.

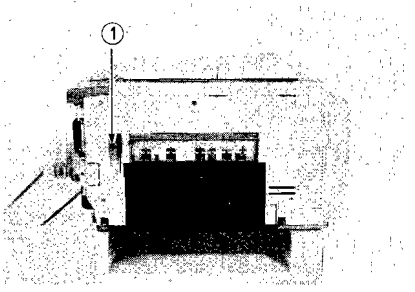

Figure 5-105

① Knob

B. Door Switches

1. Outline

As a safety precaution, the copier does not function while the front door is open. When the front door is open, microswitch MS1 is open to cut off the power supply.

2. Construction

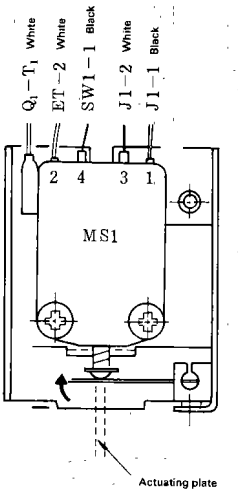

Figure 5-106

3. Removing the door switch unit

1) Open the front door
2) Unscrew the mounting screw to free the door switch unit.

Note:

Be careful not to touch the fixing assembly when removing the door switch unit.

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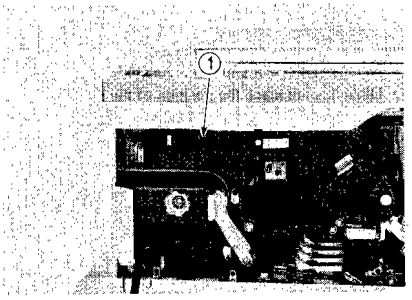

Figure 5-107

① Mounting screw

3) Remove the connectors from the microswitch, and remove the door switch unit from the copier.

C. Control Panel

1. Removing the control panel

1) Open the front door.
2) Loosen the two mounting screws and lift the control panel up.

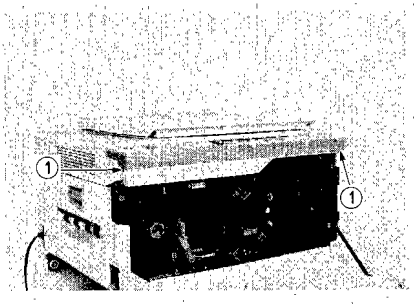

Figure 5-108

① Mounting screws

3) Disconnect the two connectors, remove the grounding wire and remove the control panel from the copier.

D. Copyboard Cover

1. Replacing the copyboard cover reflective sheet/cushion

The reflective sheet/cushion of the copyboard cover is attached to the copyboard cover with double-stick tape. Lift up and pull gently on one corner to remove it.

To reattach it, press down the entire surface of the sheet/cushion against the copyboard cover.

E. Cassette Holders (NP-3725/3525)

1. Removing the cassette holders

1) Remove the right and rear panels.
2) Remove the screw and swing out the DC controller mounting plate.
3) Unscrew the two mounting screws and remove the shaft mounting plate.

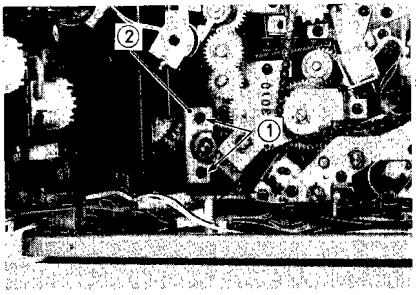

Figure 5-109

① Mounting screws ② Shaft mounting plate

4) Disconnect connector J108 on the DC controller PCB.
5) Mark the positions of the cassette holders.
6) Unscrew the four mounting screws and remove each cassette holder.

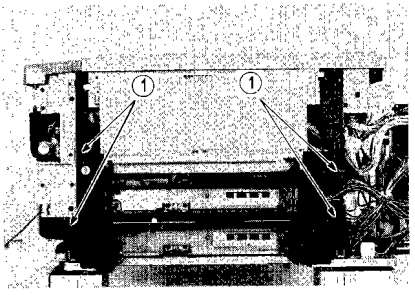

Figure 5-110

① Mounting screws

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Note:
When replacing the cassette holders, align them in the marked positions and then fasten them in place.

F. Cassette Holders (NP-3225/3025)

1. Removing the upper and lower cassette holders

(The following procedure describes the removal of the upper cassette holder. Use the same procedure to remove the lower cassette holder.)

1) Remove the right panel.
2) Draw lines to mark the position of the cassette holder.
3) Disconnect the connector.
4) Unscrew the two mounting screws, and remove the upper cassette holder.

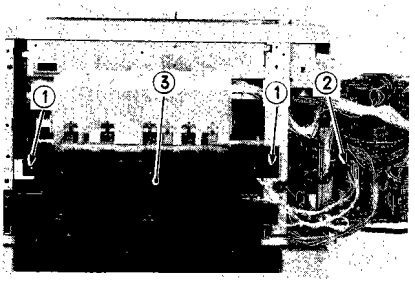

Figure 5-111

① Mounting screw
② Connector
③ Upper cassette holder

Note:
When replacing the cassette holders, align them in the marked positions and then fasten them in place.

G. Manual Feed Pick-up Assembly

1. Removing the manual pick-up assembly

1) Remove the right panel.
2) Draw lines to mark the position of the manual pick-up unit.
3) Unscrew the three mounting screws and remove the manual pick-up unit.

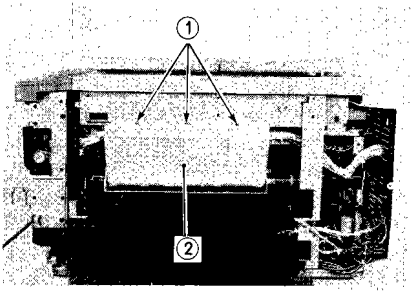

Figure 5-112

① Mounting screws
② Manual pick-up unit

Note:
When replacing the manual pick-up unit, align it in the marked position and then fasten it in place.

H. Fans

1. Outline

The copier has three fans that circulate air inside the copier to prevent components from overheating.

The main purpose of each fan is as follows.

Scanner cooling fan (FM1): Cools the scanner.
Feeder assembly fan (FM2): Used to suck the paper down against the feeder assembly.
Exhaust fan (FM3): Removes hot air from the fixing assembly.

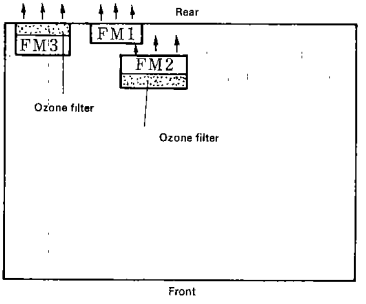

Figure 5-113 Top view

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2. Removing the scanner cooling fan (FM1)

1) Remove the top cover and rear panel.
2) Remove the screw and swing out the DC controller PCB.
3) Remove the high-voltage transformer mounting plate.
4) Remove the exhaust fan.
5) Disconnect connector J48.
6) Unscrew the three mounting screws, and remove the scanner cooling fan.

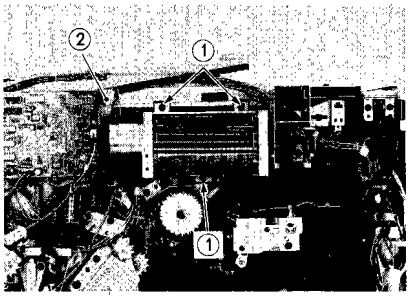

Figure 5-114

① Mounting screws ② Connector

3. Removing the feeder assembly fan (FM2) and the ozone filter

1) Remove the high-voltage transformer mounting plate.
2) Disconnect connector J47.
3) Remove the three mounting screws and remove the feeder assembly fan.

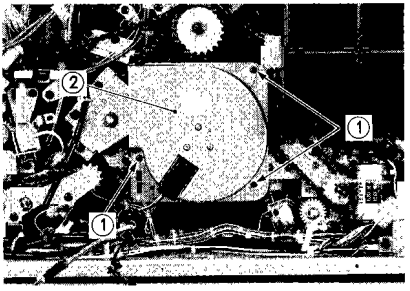

Figure 5-115

① Mounting screws ② Feeder assembly fan

4) Unscrew the two mounting screws and remove the ozone filter.

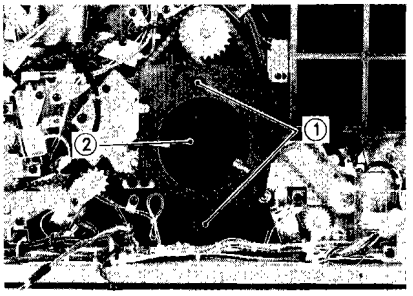

Figure 5-116

① Mounting screws ② Ozone filter

4. Removing the exhaust fan (FM3) and the ozone filter

1) Remove the top cover.
2) Remove the ozone filter.
3) Disconnect connector J3.
4) Unscrew the three mounting screws and remove the exhaust fan unit.

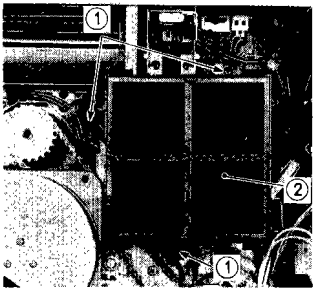

Figure 5-117

① Mounting screws ② Ozone filter

5) Unscrew the four mounting screws and remove the exhaust fan from the unit.

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5. Removing the louver drive solenoid (SL13)

1) Open the front door.
2) Remove the delivery assembly and the left rear panel.
3) Remove the fixing assembly
4) Unscrew the six mounting screws and remove the duct.

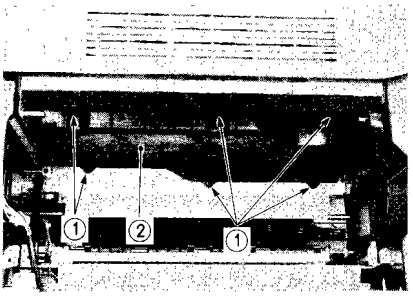

Figure 5-118

① Mounting screws ② Duct

5) Remove the copyboard glass.
6) Unscrew the two mounting screws and remove the louver drive solenoid unit.

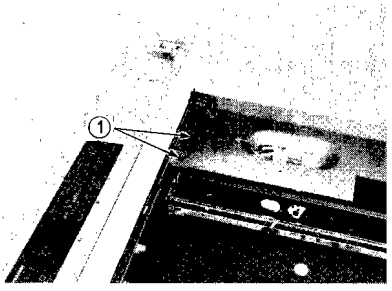

Figure 5-119

① Mounting screws

7) Remove the two connectors and remove the louver drive solenoid from the unit.

6. Positioning the louver drive solenoid

Install the solenoid so that the stroke of the plunger is 5.5 ± 0.2 mm.

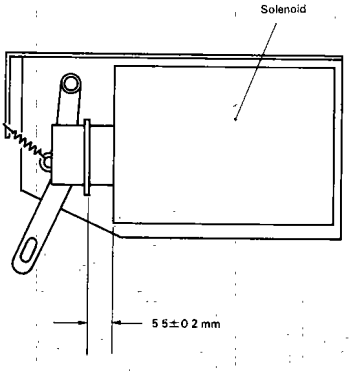

Figure 5-120

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II. DRIVE SYSTEM

A. Lens Drive Unit

1. Outline

The lens drive unit has a motor (M3) that drives the lens drive cable to position the lens.

2. Disassembly and reassembly

The lens drive unit is precisely adjusted at the factory using special tools.

Do not remove any parts or loosen any screws that are not included in the following procedures.

a. Removing the lens drive cable

1) Remove the copyboard cover and the copyboard glass.
2) Unscrew the four mounting screws and remove the upper cover of the lens.
3) Mark the position of pulley B, and loosen the mounting screw.
4) Remove the lens drive cable.

b. Installing the lens drive cable

1) Follow the numbered sequence shown in Figure 5-200 to string the lens drive cable.

Note:

Wrap the cable five turns around the capstan. (The turn closest to the motor should go to pulley B.)

2) Fix pulley B loosely in place, in the position marked previously.
3) Adjust the tension of the cable.
   Push pulley B away from the motor with a spring scale and fix the pulley securely in the position where the spring scale registers 1.2 kg.

3. Lubrication

Apply low-viscosity lubricating oil (CK-0451) evenly to the lens rail.

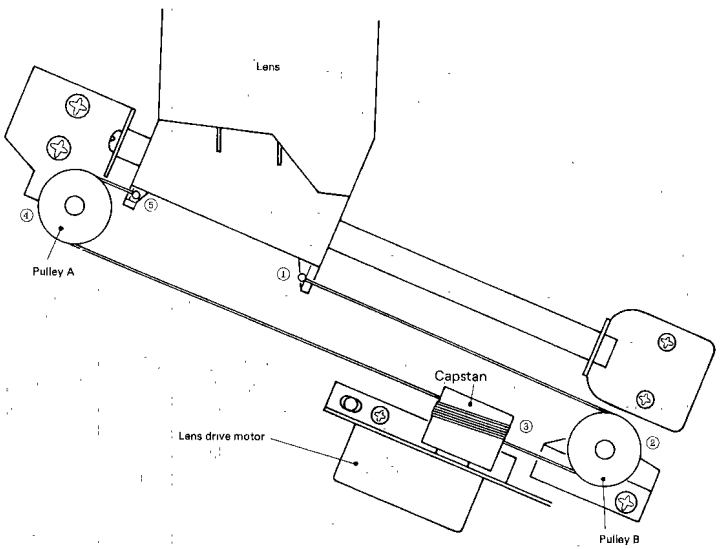

Figure 5-200

B. Scanner Drive Unit

1. Removing the mirror drive cable

1) Remove the copyboard cover, the copyboard glass, the right panel and the rear panel.
2) Remove the outer nut shown in Figure 5-201.
3) Unscrew the two mounting screws and remove the cable holding plate. (Do not loosen the hexagonal socket setscrews.)
4) Remove the mirror drive cable.

2. Installing the mirror drive cable

1) Attach the adjustment screw shown in Figure 5-201. (Fasten the nuts somewhat loosely.)
2) Follow the numbered sequence shown in Figure 5-201 to attach the mirror drive cable.

Notes:

1. At position 2, the cable should go around the lower end of the pulley.
2. At position 4, wrap the cable four turns counterclockwise around the capstan.

3) Adjust the tension of the cable.
4) Adjust the position of the mirror.

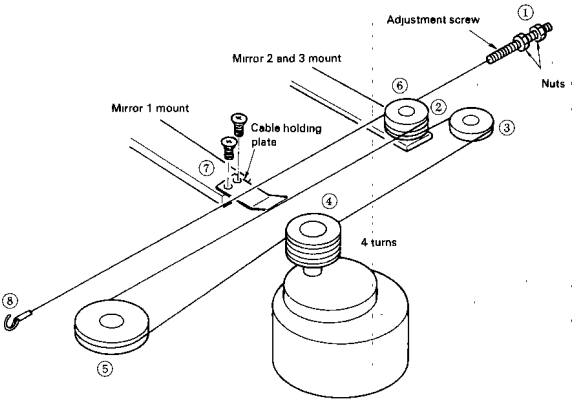

Figure 5-201

3. Adjusting the tension of the mirror drive cable

The tension of the mirror drive cable is adjusted by the adjustment screw.

Remove the copyboard glass and move the mirror 1 mount to the left (toward the home position). Pull out on the cable at position A in Figure 5-202 with a spring scale. Adjust the tension so that the spring scale reads 1,200g ± 200g when the cable is pulled out 20 mm.

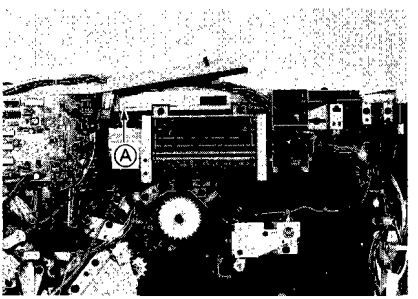

Figure 5-202

4. Adjusting the position of the mirror

(Length of optical path between mirror 1 and mirror 2)

When the mirror drive cable is replaced, it is necessary to readjust the positions of the mirrors.

This is done by changing the position at which the cable holding plate of the mirror 1 mount is attached to the drive cable. (The hexagonal socket setscrews must be loosened.)

Note:

The cable stretches as more copies are made, so the tension must be readjusted periodically.

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1) Mark a sheet (B) of A4/Letter or A3/Ledger copy paper as shown in the Figure 5-203.

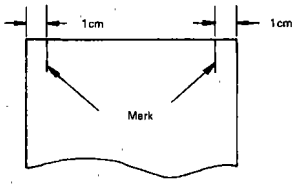

Figure 5-203

2) Make a copy (A) of the original sheet (B) of paper.
3) Place a blank sheet of paper on the copyboard and feed the original sheet (B) through the copier using manual feed.

The copy (B) that was fed through will show the amount of shrinkage due to heat. Leave the copy in the open air to cool for 5 minutes.

4) Adjust the position of mirror 1 mount so that when the lines on the left side of the copy (A) and the original sheet (B) are aligned, the distances x and y shown in Figure 5-204 are equal.

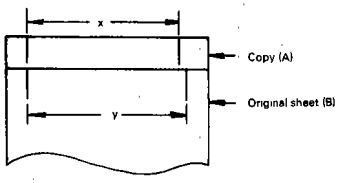

Figure 5-204

x = y Correct
x > y Move mirror 1 mount in the a direction.
x < y Move mirror 1 mount in the b direction.

Note:
If the distance between mirror 1 and mirror 2 is decreased, the copy image becomes larger; if the distance is increased, the image becomes smaller.

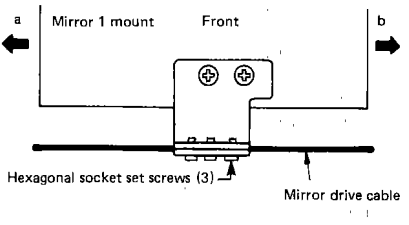

Figure 5-205 Top view

5. Lubrication

Clean the scanner rail and lubricate it with low-viscosity lubricating oil.

6. Removing the scanner drive motor

1) Remove the copyboard cover, the copyboard glass, the top cover, the right panel, and the rear panel.
2) Remove the mirror drive cable.
3) Remove the screw and swing out the DC controller PCB.
4) Unscrew the four mounting screws and remove the scanner drive motor.

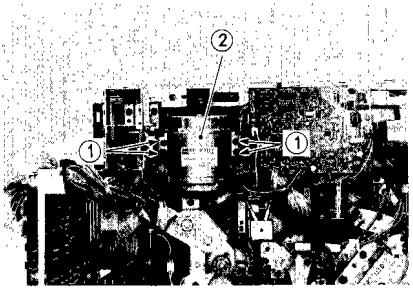

Figure 5-206

① Mounting screws ② Scanner drive motor

C. Main Motor Unit

1. Removing the main motor from the NP-3725/3525

1) Open the front door and take out the photosensitive drum.
2) Remove the rear panel.
3) Remove the screw and swing out the DC controller PCB.
4) Remove the high-voltage transformer mounting plate.
5) Remove the feeder assembly fan (FM2).
6) Remove the ozone filter holder.
7) Remove the grip ring, the three main motor gears, and the three chains.

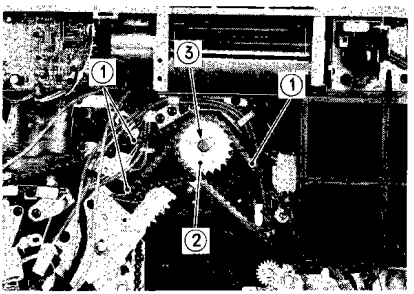

Figure 5-207

① Chains
② Main motor gears
③ Grip ring

8) Unscrew the mounting screw and remove the high-voltage cable holder.

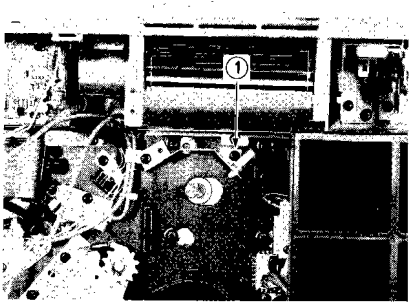

Figure 5-208

① Mounting screw

9) Loosen the four mounting screws of the main motor.

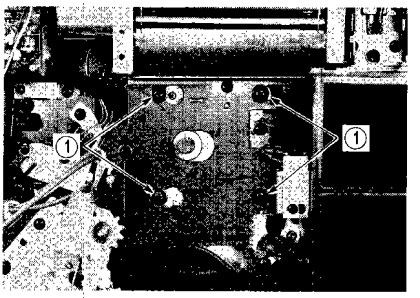

Figure 5-209

① Mounting screws

10) Disconnect connectors J602 and J609 from the main motor.
11) Remove the separation claw unit.
12) Move the main motor to the right, and remove it from the copier.

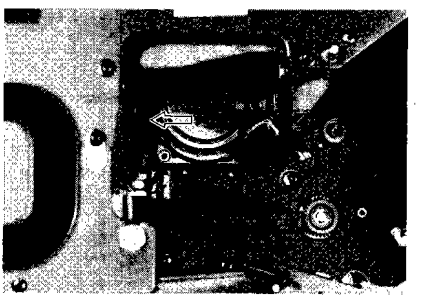

Figure 5-210

① Main motor

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7) Remove the E-ring, gear, and chain. Be careful not to lose the dowel pin.

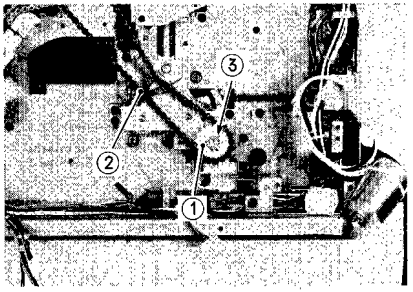

Figure 5-219

① Gear ② Chain ③ E-ring

8) Unscrew the three mounting screws and remove the feeder/fixing assembly drive unit.

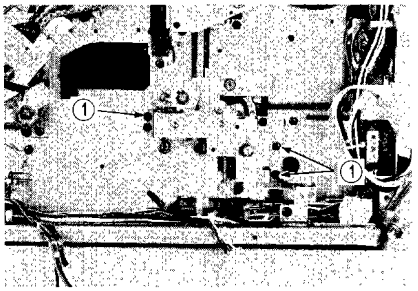

Figure 5-220

① Mounting screws

4. Positioning the delivery/refeed roller solenoid (SL8) (NP-3725/3525 only)

Push gear A so that it engages gear B and move solenoid SL8 in the C direction until the plunger is all the way in and then fasten it in place.

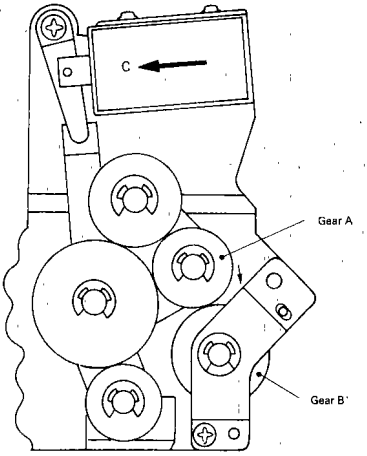

Figure 5-221

5. Mounting direction for the holding tray feed roller clutch (NP-3725/3525)

Mount the holding tray feed roller clutch so that the part indicated by A faces the side plate.

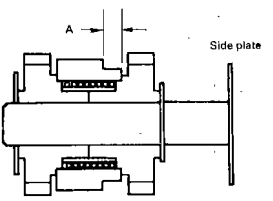

Figure 5-222

When the clutch springs are replaced, wipe the new springs dry and lubricate them with low-viscosity lubricating oil (CK-0451).

III. PAPER TRANSPORT SYSTEM

A. Cassette

1. Cassette spring lifting force NP-3225/3025 cassettes only)

Insufficient lifting force by the springs that push up the paper-lifting plate may result in poor pick-up of paper from the cassette.

If there are pick-up problems, use a spring scale to check the cassette spring lifting force. If it does not meet specifications, replace the springs.

Hold a scale (ruler) vertical in the gap at the front end of the lifting plate, as shown in Figure 5-300, and position a spring scale (CK-0054) approximately 25 mm from the front end of the plate, halfway between the two cassette springs.

Push the spring scale downward to depress the paper-lifting plate the distances specified by Table 5-300, and note the force registered on the spring scale. If the force is outside specifications, replace the springs.

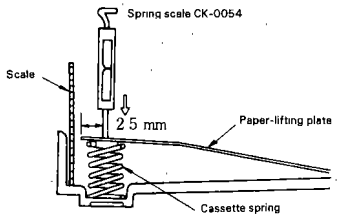

Figure 5-300

Size	Depressed 3 mm	Depressed 23 mm	Depressed 28 mm
A3	390±30g		1,000±100g
B4	390±30g		920±90g
A4	390±30g		1,000±100g
B5	390±30g		920±90g
A4R	350±20g		840±90g
B5R	310±20g		700±70g
U1	330±40g	650±80g	
U2	350±40g	570±60g	
U3	330±40g	750±80g	

Table 5-300

B. Pick-up Control Unit (NP-3725/3525)

1. Construction

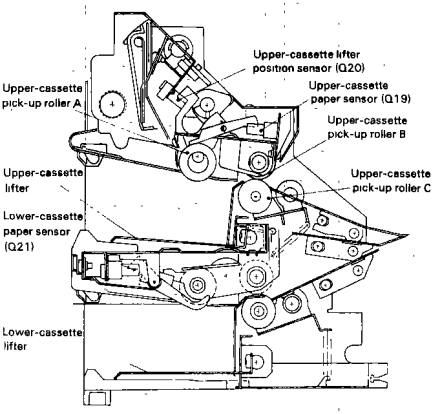

Figure 5-301 Cross-sectional drawing

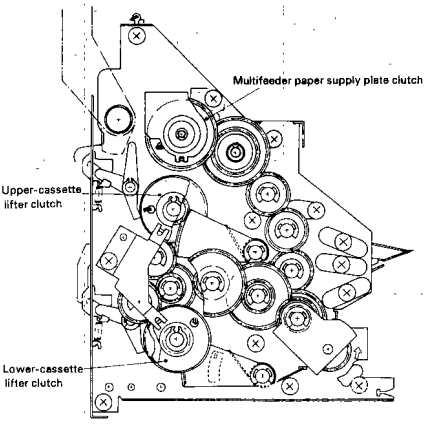

Figure 5-302 Rear view

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D. Drum Drive Unit

1. Removing the drum drive unit

1) Open the front door and take out the photosensitive drum.
2) Remove the rear panel.
3) Remove the screw and swing out the DC controller PCB.
4) Remove the high-voltage transformer mounting plate.
5) Remove the feeder assembly fan.
6) Remove the ozone filter holder
7) Remove the grip ring, gear, spring and chain.

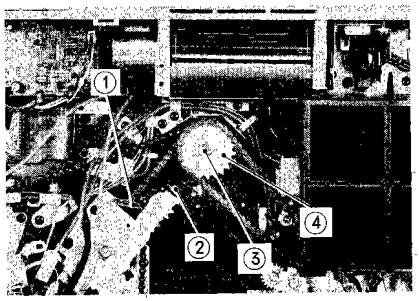

Figure 5-211 (NP-3725/3525)

① Spring
② Chain
③ Grip ring
④ Gear

8) Unscrew the four mounting screws and remove the drum drive unit.

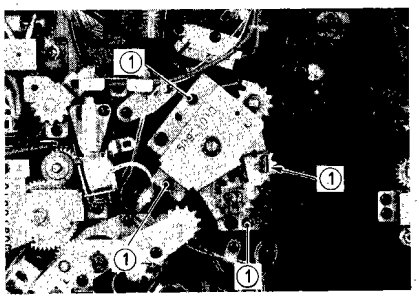

Figure 5-212

① Mounting screw

E. Developing Assembly Clutch Unit

1. Removing the developing assembly clutch unit

1) Remove the rear panel.
2) Remove the screw and swing out the DC controller PCB.
3) Disconnect the two connectors.
4) Loosen the hexagonal socket setscrews and remove the two spring clutches.

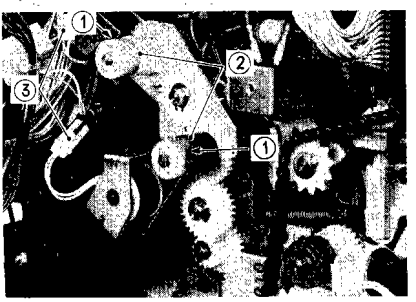

Figure 5-213

① Hexagonal socket setscrew ③ Connectors
② Spring clutches

5) Unscrew the two mounting screws and remove the developing assembly clutch unit.

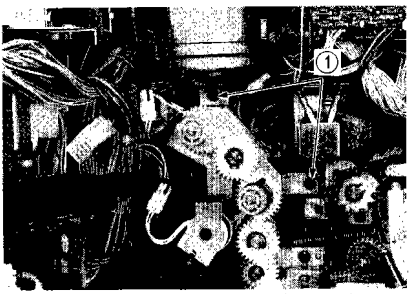

Figure 5-214

① Mounting screws

2. Lubrication

When the clutch spring is replaced, wipe it dry and then apply low-viscosity lubricating oil.

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F. Feeder/Fixing Assembly Drive Unit

1. Removing the feeder/fixing assembly drive unit on the NP-3725/3525

1) Remove the rear and left rear panels.
2) Remove the screw and swing out the DC controller PCB.
3) Remove the high-voltage transformer mounting plate.
4) Remove the exhaust fan (FM3) and the feeder assembly fan (FM2).
5) Remove the fixing assembly.
6) Pull out the left rear lifting handle.
7) Loosen the nut and remove the noise filter.

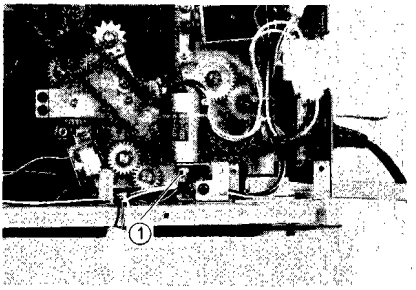

Figure 5-215

① Nut

8) Remove the solenoid connector.
9) Remove the E-ring, gear, and chain. Be careful not to lose the dowel pin.

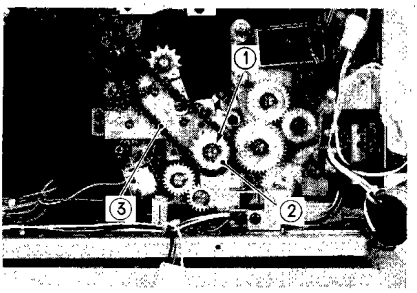

Figure 5-216

① E-ring ② Gear ③ Chain

10) Unscrew the four mounting screws and remove the feeder/fixing assembly drive unit.

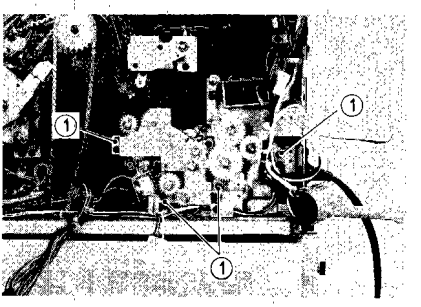

Figure 5-217

① Mounting screws

2. Installing the feeder/fixing assembly drive unit on the NP-3725/3525

Installation is the reverse procedure of removal. However, note the following:

Make certain that the feeder roller shaft is firmly inserted in the bearing of the feeder/fixing assembly drive unit.

3. Removing the feeder/fixing assembly drive unit on the NP-3225/3025

1) Remove the rear and left rear panels.
2) Remove the screw and swing out the DC controller PCB mounting plate.
3) Remove the high-voltage transformer mounting plate.
4) Remove the feeder assembly fan (FM2).
5) Remove the fixing assembly.
6) Loosen the nut and remove the noise filter.

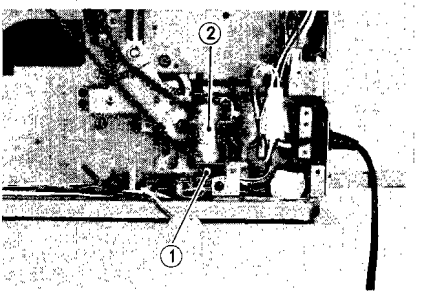

Figure 5-218

① Nut ② Noise filter

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2. Removing the upper and lower cassette pick-up roller clutches

1) Remove the cassette holder.
2) Unscrew the mounting screw and remove the clutch rotation stop plate.
3) Disconnect the connector.
4) Remove the grip ring, and remove the pick-up roller clutch.

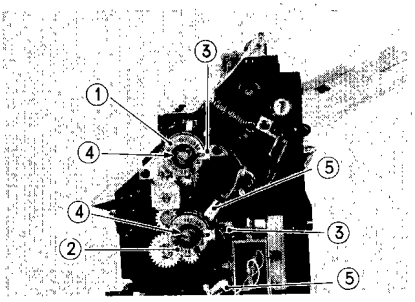

Figure 5-303

① Upper-cassette pick-up roller clutch
② Lower-cassette pick-up roller clutch
③ Clutch rotation stop plate
④ Grip ring
⑤ Connector

3. Removing the upper and lower cassette lifter clutches

1) Remove the cassette holder.
2) Disconnect the connector.
3) Unscrew the mounting screw and remove the clutch rotation stop plate.
4) Remove the grip ring and remove the lifter clutches.

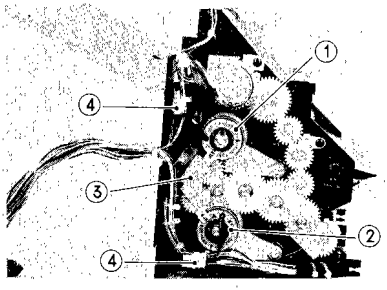

Figure 5-304

① Upper-cassette lifter clutch ③ Clutch rotation stop plate
② Lower-cassette lifter clutch ④ Connector

4. Removing the multifeeder paper supply plate clutch

1) Remove the cassette holder.
2) Disconnect the connector.
3) Unscrew the mounting screw and remove the multifeeder paper supply plate clutch assembly.

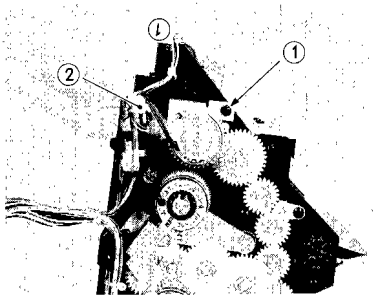

Figure 5-305

① Mounting screw ② Connector

4) Remove the grip ring, and remove the gear and the bearing.

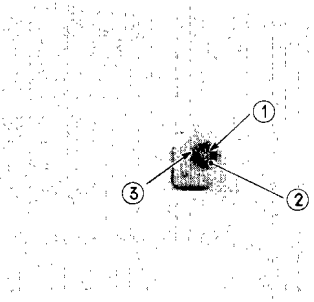

Figure 5-306

① Grip ring ③ Bearing
② Gear

5) Remove the E-ring and then the multifeeder paper supply plate clutch.

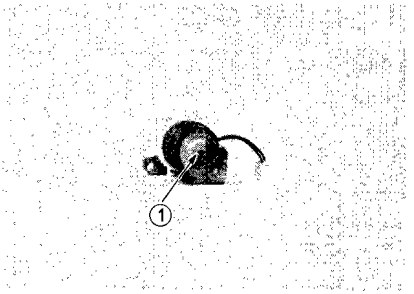

Figure 5-307

① E-ring

5. Removing the upper-cassette separation, feeder and pick-up rollers

1) Remove the pick-up unit from the copier.
2) Open the multifeeder tray. Unscrew the two mounting screws and remove the upper-cassette pick-up guide plate 2.

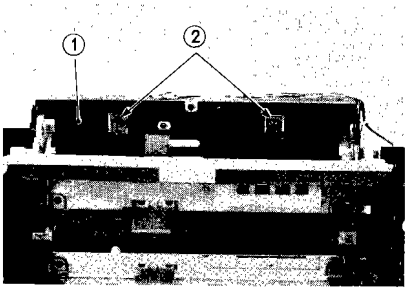

Figure 5-308

① Upper-cassette pick-up guide plate 2
② Mounting screws

3) Unscrew the two mounting screws and remove the upper-cassette pick-up guide plate 1.

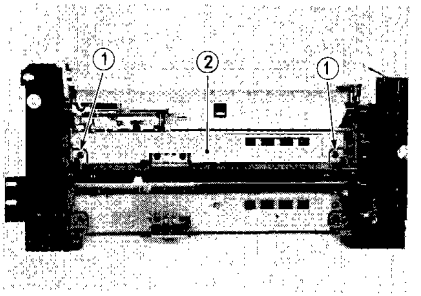

Figure 5-309

① Mounting screws ② Upper-cassette pick-up guide plate 1

4) Remove the retaining ring by hand or with needlenose pliers, and remove the bearing.

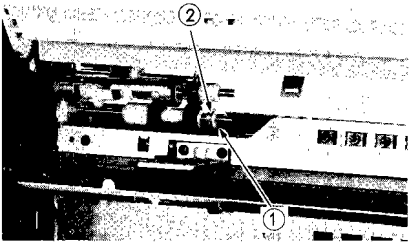

Figure 5-310

① Retaining ring ② Bushing

5) Remove the bushing from the guide plate and pull the separation roller shaft gorward and out.
6) Remove the retaining ring and separation roller.

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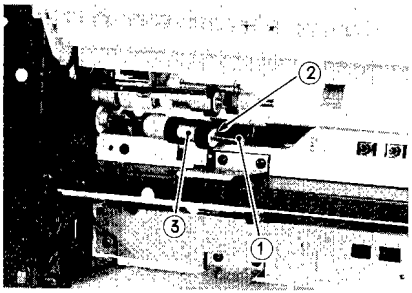

Figure 5-311

① Separation roller shaft
② Retaining ring

Figure 5-311a

7) Remove the retaining ring, one-way roller and feeder roller.

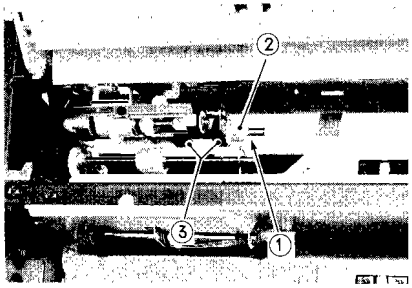

Figure 5-312

Figure 5-312a

8) Remove the mounting screw and stopper plate.
9) Disconnect the connector (2P) and remove the grip ring.
Remove the upper-cassette pick-up clutch (CL1) unit.

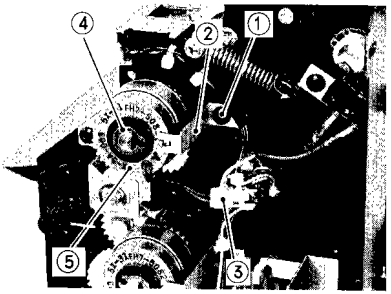

Figure 5-313

① Mounting screw ② Stopper plate
③ Connector ④ Grip ring
⑤ Upper-cassette pick-up clutch unit

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10) Remove the E ring and bearing.

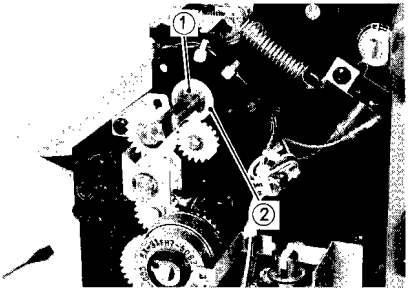

Figure 5-314

① Ring ② Bearing

11) Unscrew the two mounting screws, spring and disconnect the connector (3P). Remove the pick-up roller with the mounting plate.

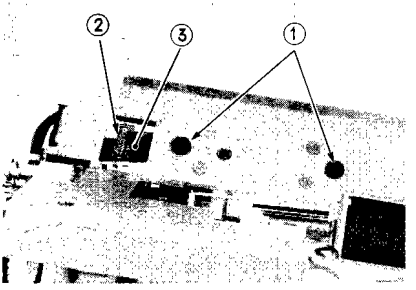

Figure 5-315

① Mounting screw ② Spring ③ Connector

12) Remove the two E-rings and the two pick-up rollers.

Note 1: Be careful not to lose the pin.
2: Be careful of the direction of rotation marked by an arrow on the pick-up roller when attaching the pick-up roller.

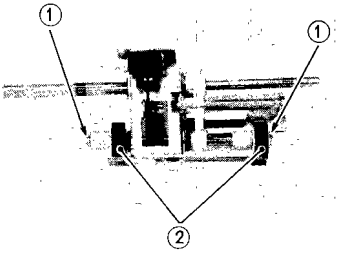

Figure 5-316

① E-ring ② Pick-up roller assembly

6. Removing the lower-cassette separation and feeder rollers

1) Remove the pick-up mounting plate from the copier.
2) Unscrew the two mounting screws and remove the lower-cassette pick-up guide plate 1.

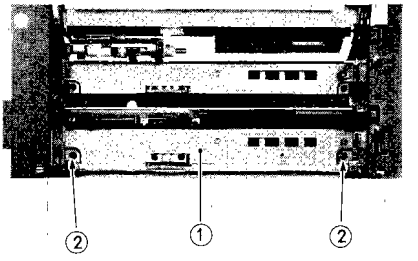

Figure 5-317

① Lower-cassette pick-up guide plate 1
② Mounting screws

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3) Unscrew the two mounting screws and remove the lower-cassette pick-up guide plate 2.

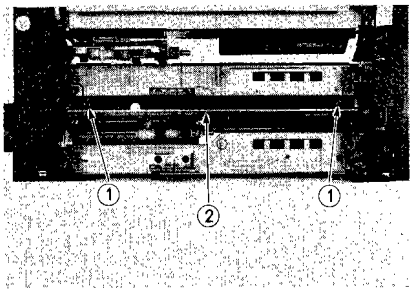

Figure 5-318

① Mounting screws
② Lower-cassette pick-up guide plate 2

4) Remove the two E-rings and the two pick-up rollers.

Note 1: Be careful not to lose the pin.
2: Be careful the direction of rotation marked by an arrow on the pick-up roller, when attaching the pick-up roller.

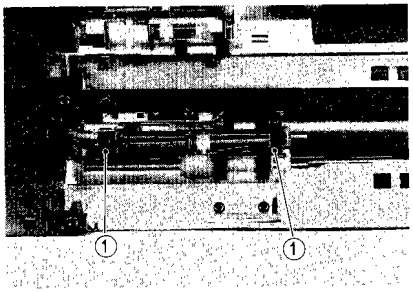

Figure 5-319

① E-ring ② Pick-up roller

5) Remove the retaining ring by hand or with needlenose pliers, and remove the bushing.

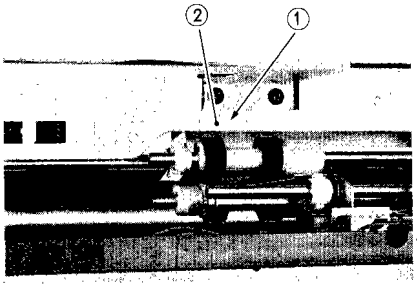

Figure 5-320

① Retaining ring ② Bushing

6) Remove the bushing from the guide plate and pull the separation roller shaft forward and out.
7) Remove the retaining ring and separation roller.

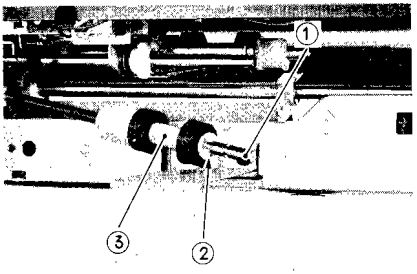

Figure 5-321

① Separation roller shaft ③ Separation roller
② Retaining ring

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8) Remove the retaining ring, one-way roller and feeder roller.

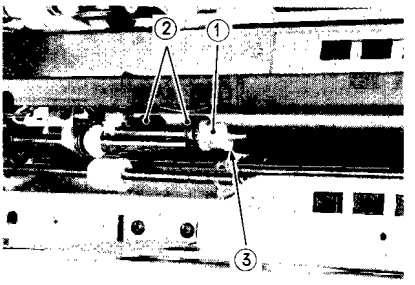

Figure 5-322

① One-way roller
② Feeder roller
③ Retaining ring

7. Adjusting the solenoid stroke (NP-3725/3525)

a. Upper-cassette pick-up roller release solenoid

Install solenoid SL11 so that its plunger stroke is 6 ± 0.2 mm.

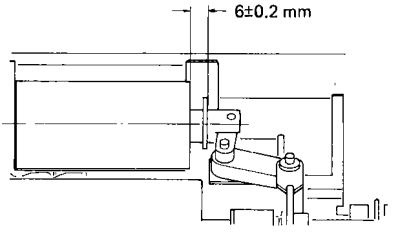

Figure 5-325

b. Lower-cassette pick-up roller release solenoid

Install solenoid SL12 so that its plunger stroke is 5.5 ± 0.2 mm.

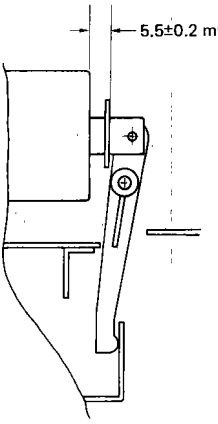

Figure 5-326

8. Releasing the lifter

The lifter is released by pressing up the lever indicated in the diagram.

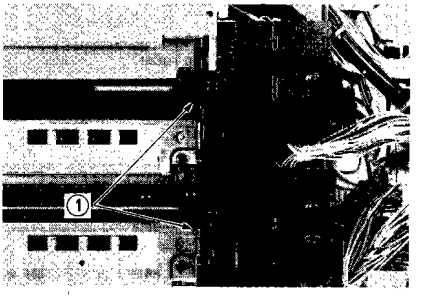

Figure 5-327

① Lever

9. Lubrication

Periodically lubricate the one-way clutches (Figures 5-315 and 5-323) with high-viscosity lubricating oil.

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C. Pick-up Control Unit (NP-3225/3025)

1. Construction

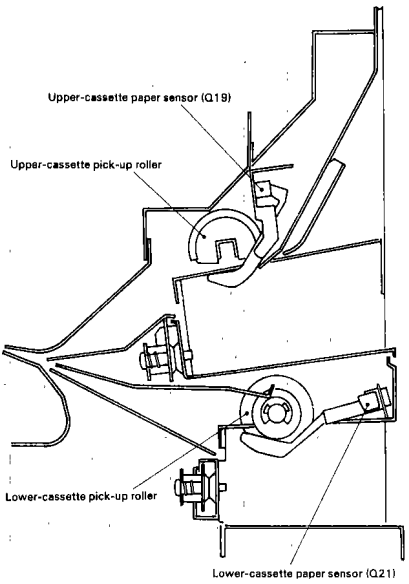

Figure 5-328

2. Removing the upper-cassette pick-up roller clutch

1) Remove the rear panel.
2) Remove the screw and swing out the DC controller PCB.
3) Remove the high-voltage transformer mounting plate.
4) Remove the developing assembly clutch unit.
5) Disconnect the two connectors from the upper-cassette pick-up roller clutch solenoid and unscrew the mounting screw. Loosen the hexagonal socket setscrew, and pull out the upper-cassette pick-up roller clutch unit.

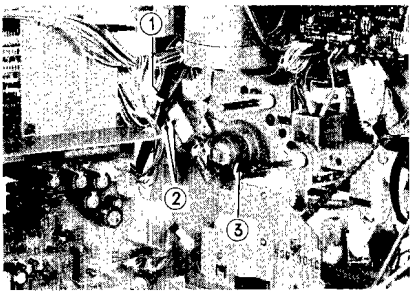

Figure 5-329

① Mounting screws
② Connectors
③ Hexagonal socket setscrew

6) Loosen the hexagonal socket setscrew and remove the upper cassette pick-up roller clutch.

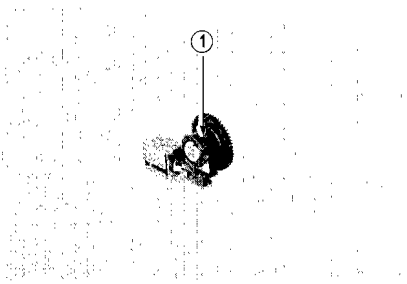

Figure 5-330

①Hexagonal socket setscrew

3. Removing the lower-cassette pick-up roller clutch

1) Remove the rear panel.
2) Remove the screw and swing out the DC controller PCB.
3) Remove the developing assembly clutch unit.
4) Disconnect the connector.
5) Remove the chain.
6) Unscrew the three mounting screws and remove the pick-up drive unit.

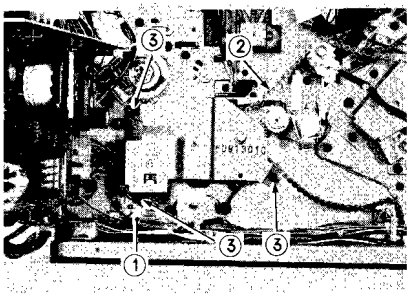

Figure 5-331

① Connector
② Chain
③ Mounting screw

7) Remove the E-ring and unscrew the two mounting screws, and remove the lower-cassette pick-up roller clutch unit.

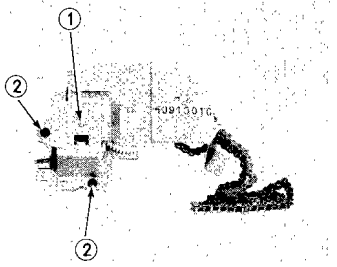

Figure 5-332

① E-ring
② Mounting screw

8) Remove the lower-cassette pick-up roller clutch from the shaft.

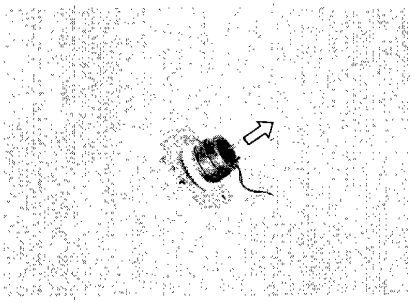

Figure 5-333

4. Removing the upper-cassette pick-up rollers

1) Remove the rear and right panels.
2) Remove the screw and swing out the DC controller PCB.
3) Remove the manual feed pick-up unit.
4) Push in the plunger of the upper-cassette pick-up roller clutch solenoid, and turn the upper-cassette pick-up roller shaft a half turn.
5) Unscrew the mounting screws and remove the upper-cassette pick-up rollers.

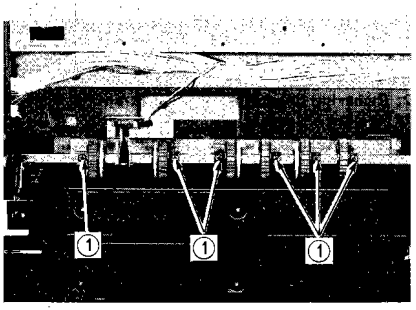

Figure 5-334

① Mounting screws

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5. Removing the lower-cassette pick-up rollers

1) Remove the right panel.
2) Remove the lower cassette holder.
3) Remove the E-ring and the lower-cassette pick-up roller unit.
4) Remove the E-ring, and remove the pick-up roller from the pick-up roller shaft.

6. Reassembling the pick-up roller unit

Figures 5-336 and 5-337 show how to reassemble the pick-up roller unit.

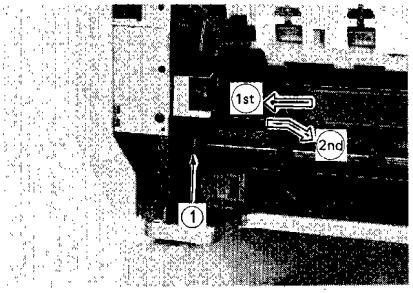

Figure 5-335

① E-ring

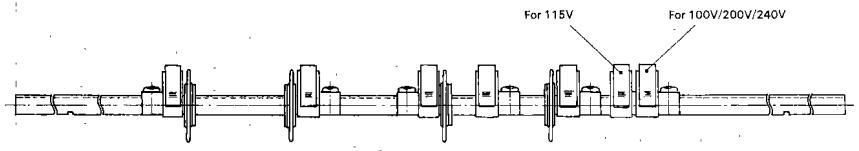

Figure 5-336 Upper-cassette pick-up roller unit

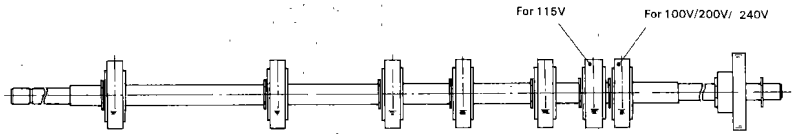

Figure 5-337 Lower-cassette pick-up roller unit

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7. Lubrication

When the clutch springs are replaced, wipe the new ones dry and lubricate them with low-viscosity lubricating oil (CK-0451).

Note:
Replacing the clutch springs.

1) With the gear facing you, loosen the setscrew and rotate the clutch clockwise and remove it from the sleeve.
2) During reinstallation, allow for thrust clearance by inserting a 0.1-0.2 mm thickness gauge into the area indicated by ⓐ , and then tighten the hexagon socket setscrew.

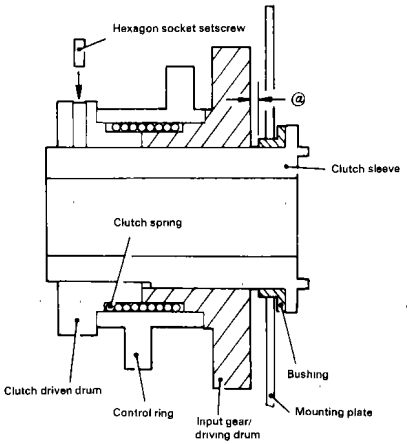

Figure 5-338

Do not tighten the hexagon socket setscrew too much or it may not be possible to insert the shaft into the sleeve.

After inserting the shaft, the hexagon socket setscrew can be tightened further.

D. Feeder Assembly

1. Removing the feeder assembly

1) Remove the rear panel.
2) Remove the screw and swing out the DC controller PCB.
3) Remove the high-voltage transformer mounting plate.
4) Remove the feeder assembly fan (FM2) and the ozone filter holder.
5) Remove the ground cable.
6) Put the high-voltage cable for the transfer/separation corona assembly and the ground cable into the copier.
7) Remove the spring.
8) Remove the E-ring and the gear.

Note:
Be careful not to lose the dowel pin.

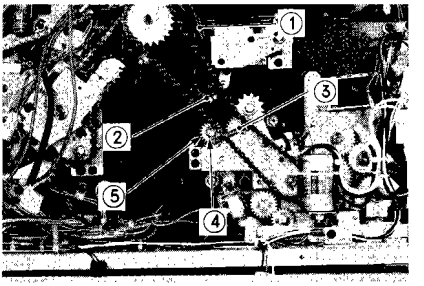

Figure 5-339

① High-voltage cable
② Ground cable
③ Spring
④ E-ring
⑤ Gear

9) Remove the E-ring and the bearing.

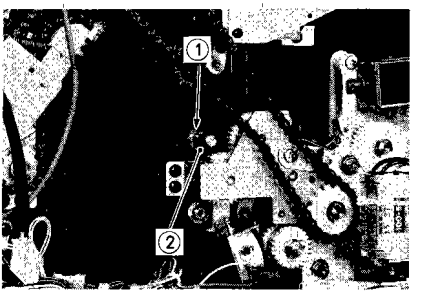

Figure 5-340

① E-ring
② Bearing

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10) Open the front door and remove the photosensitive drum.
11) Remove the transfer/separation corona assembly and the pre-transfer corona assembly.
12) Attach the lower transfer guide to the upper transfer guide plate with tape.
13) Remove the E-ring and the bearing.

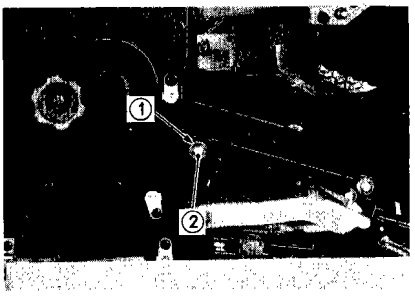

Figure 5-341

① E-ring ② Bearing

14) Grasp the front of feeder assembly and pull it gently toward the front side of the copier.

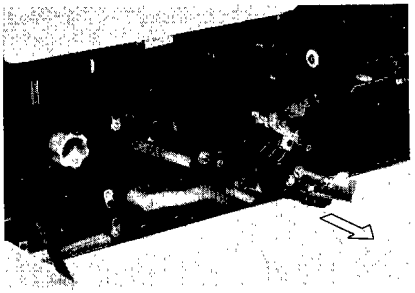

Figure 5-342

2. Removing the feeder belt

1) Remove the feeder assembly from the copier.
2) Turn the feeder assembly over and unscrew the four mounting screws.

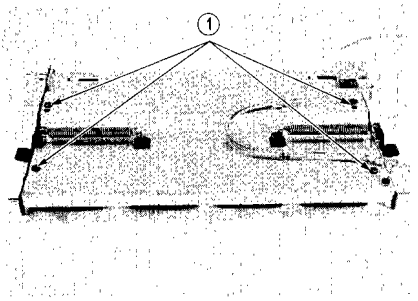

Figure 5-343

① Mounting screws

3) Remove the three E-rings and the three bushings.

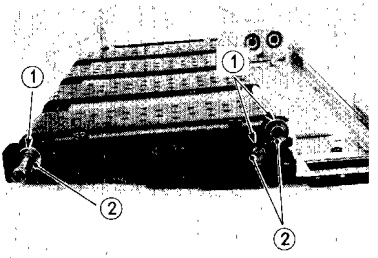

Figure 5-344

① E-rings ② Bushings

4) Push the feeder shaft into the feeder assembly and lift up the duct plate.
5) Remove the feeder belt.

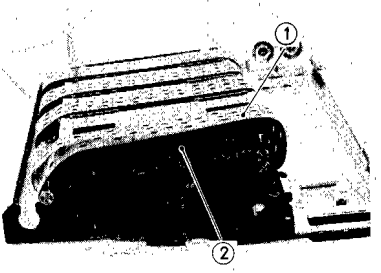

Figure 5-345

① Feeder belt ② Duct plate

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E. Transfer Guides

1. Removing the lower transfer guide plate

1) Remove the rear panel.
2) Remove the screw and swing out the DC controller PCB.
3) Disconnect connector J39.

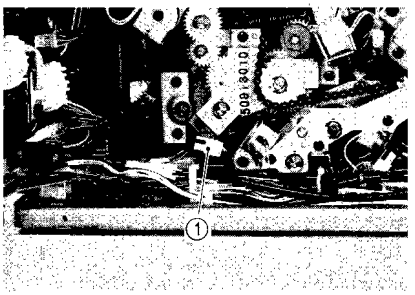

Figure 5-346

① Connector

4) Open the front door.
5) Remove the photosensitive drum, the pre-transfer corona assembly, and the transfer/separation corona assembly.
6) Unscrew the mounting screw and remove the positioning plate.
7) Pull the lower transfer guide plate forward.

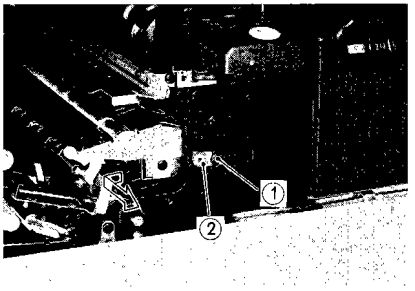

Figure 5-347

① Mounting screw ② Positioning plate

2. Removing the upper transfer guide plate

1) Remove the rear panel.
2) Remove the screw and swing out the DC controller PCB.
3) Loosen the hexagon socket setscrew of the registration roller clutch.
4) Unscrew the mounting screw, disconnect the connector from the solenoid, and remove the registration roller clutch assembly.

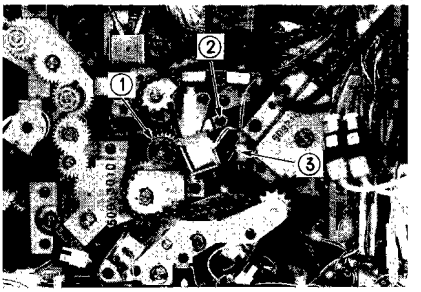

Figure 5-348

① Hexagon socket setscrew ③ Connector
② Mounting screw

5) Remove the E-ring and the bushing.

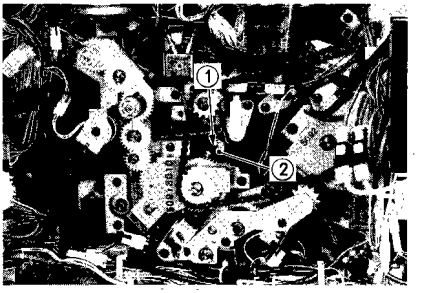

Figure 5-349

① E-ring ② Bushing

6) Open the front door and remove the drum unit and the pre-transfer corona assembly.

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7) Remove the E-ring and the bushing.

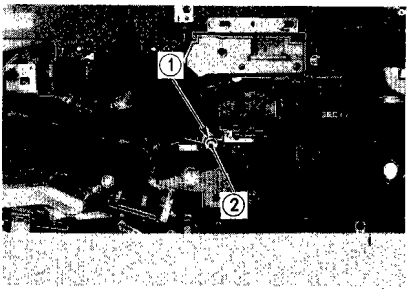

Figure 5-350

① E-ring ② Bushing

8) Push the upper transfer guide plate toward the rear and separate it from the front plate. Then pull the roller forward.

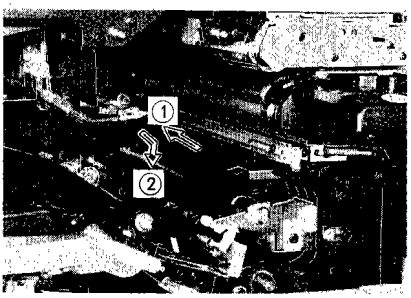

Figure 5-351

F. Delivery Assembly

1. Construction

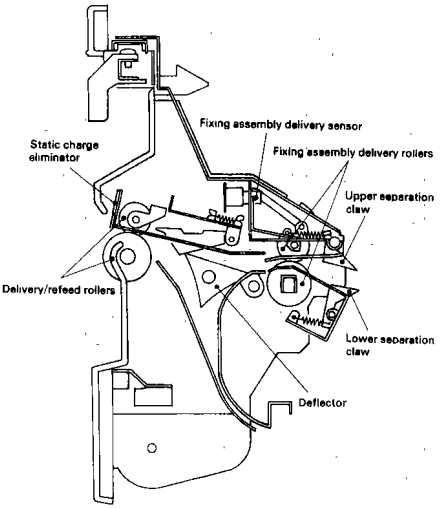

Figure 5-352 NP-3725/3525

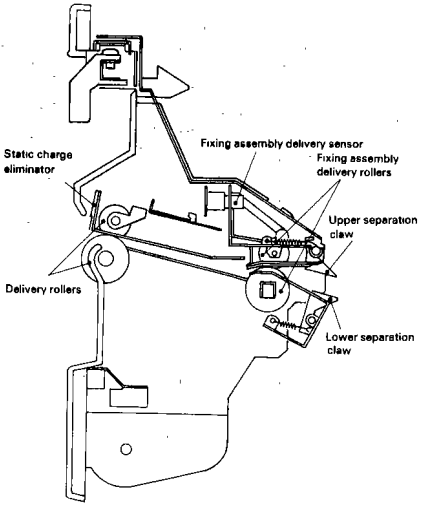

Figure 5-353 NP-3225/3025

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2. Removing the delivery assembly

1) Open the front door and the delivery assembly.
2) Disconnect connector J31.
3) Unscrew the mounting screw and remove the ground wire.
4) Unscrew the mounting screw and remove the delivery assembly support strap.

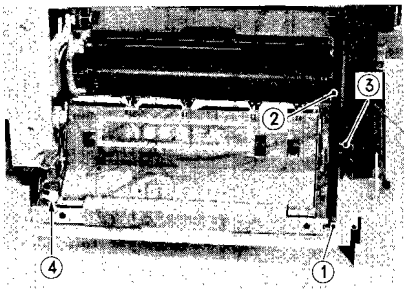

Figure 5-354

① Mounting screw
② Support strap
③ Ground wire
④ Connector

5) Unscrew the two mounting screws and remove the positioning plate. Support the delivery unit with one hand while doing this.

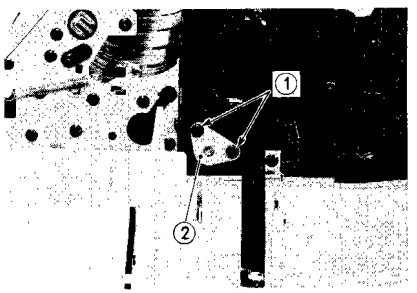

Figure 5-355

① Mounting screws
② Positioning plate

6) Remove the delivery assembly.

3. Removing the upper separation claw

1) Open the delivery assembly.
2) Unscrew the two mounting screws and remove the delivery assembly upper cover.

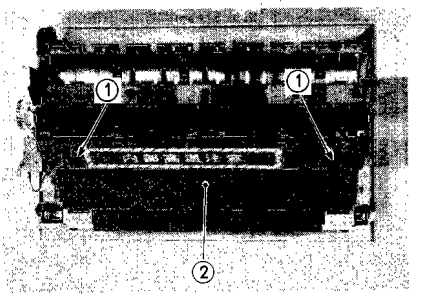

Figure 5-356

① Mounting screws
② Upper cover

3) Remove the spring.
4) Unscrew the mounting screw and remove the claw mounting plate.
5) Remove the upper separation claw from the plate.

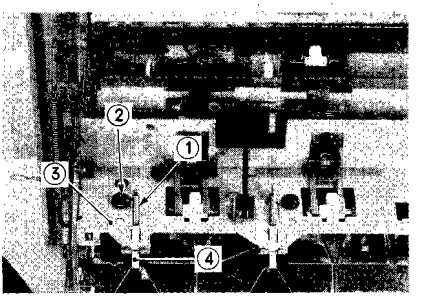

Figure 5-357

① Spring
② Mounting screw
③ Claw mounting plate
④ Upper separation claw

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4. Removing the lower separation claw

1) Open the delivery assembly.
2) Unscrew the four mounting screws and remove the lower separation claw holder.

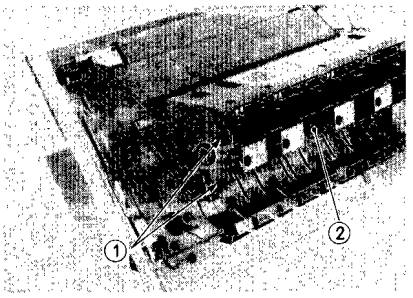

Figure 5-358

① Mounting screws ② Lower separation claw

3) Remove the spring.

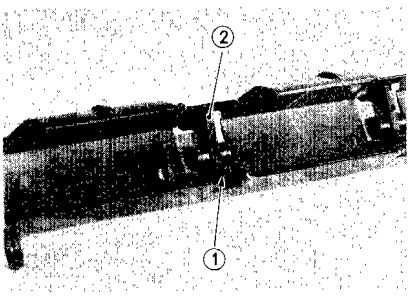

Figure 5-359

① Spring ② Lower separation claw

4) Unscrew the mounting screw and remove the support plate and the lower separation claw.

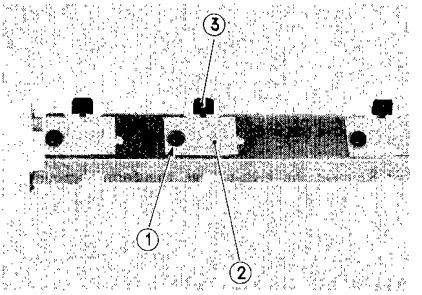

Figure 5-360

① Mounting screw ③ Lower separation claw
② Support plate

5. Adjusting the position of the deflector solenoid

Loosen the screw and push lightly on the solenoid plunger. (1 ➡)

The paper deflector will move in the direction shown in Figure 5-361b and make contact with the paper guide plate.

Use a screw to install the solenoid with its plunger held at the position marked A (⬅ 2) while the deflector and guide plate are in this position.

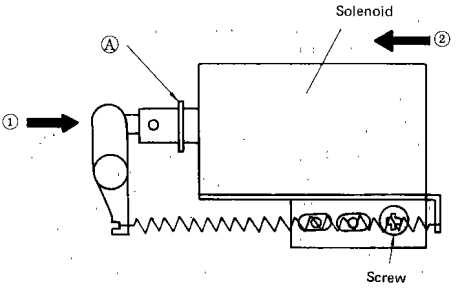

Figure 5-361a

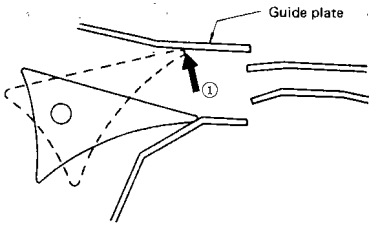

Figure 5-361b

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G. Duplexing Feeder Assembly (NP-3725/3525 only)

1. Removing the guide plate unit from the duplexing feeder assembly.

1) Remove the rear panel.
2) Remove the screw and swing out the DC controller PCB.
3) Remove the high-voltage transformer mounting plate.
4) Remove the feeder/fixing assembly drive unit.
5) Remove the feeder assembly.
6) Disconnect connector J83.

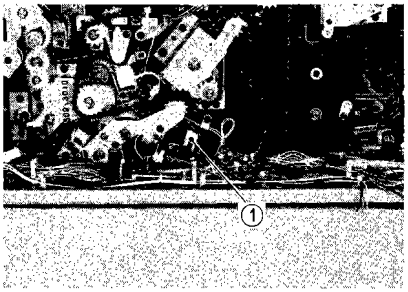

Figure 5-362

① Connector

7) Unscrew the two mounting screws and remove the delivery assembly bottom cover.

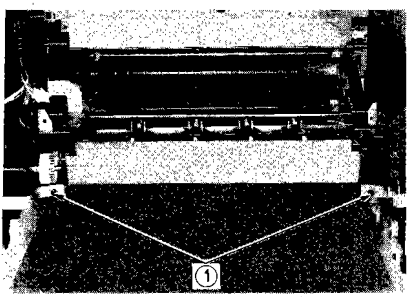

Figure 5-363

① Mounting screws

8) Remove the front door.
9) Unscrew the mounting screw①.
10) Unscrew the mounting screws and remove the positioning plates.

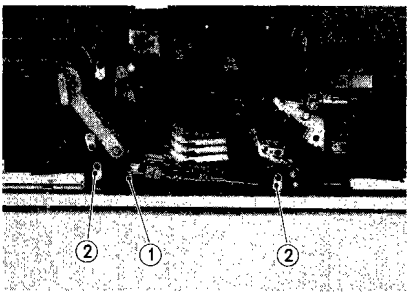

Figure 5-364

① Mounting screw ② Positioning plate

11) Pull the guide plate unit toward the front a little, and then remove it from the delivery assembly side.

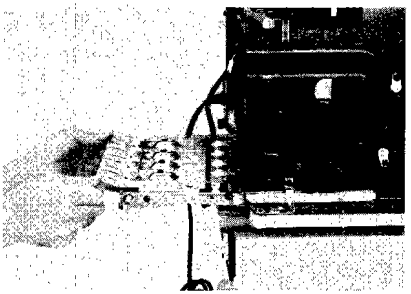

Figure 5-365

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2. Removing the registration roller 2 unit

1) Remove the guide plate unit (page 5-30).
2) Lift the upper guide plate of the registration roller 2 unit.
3) Remove the spring.

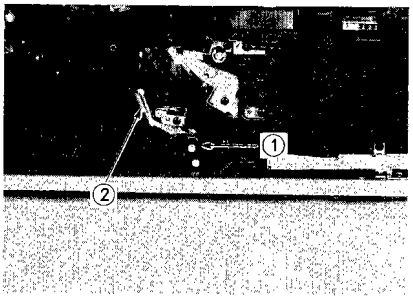

Figure 5-366

① Spring ② Upper guide plate

4) Disconnect connector J83.
5) Remove the chain.

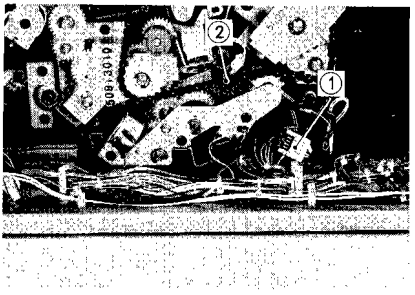

Figure 5-367

① Connector ② Chain

6) Unscrew the three mounting screws and pull out the registration roller 2 unit.

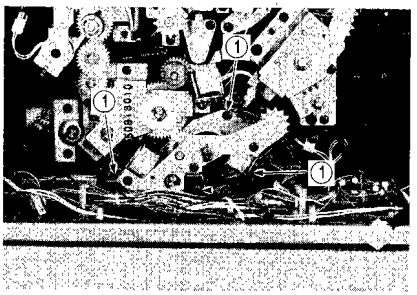

Figure 5-368

① Mounting screw

3. Adjusting side-to-side registration for second copying in two-sided, overlay copying operation (Q16 position).

Adjusting side-to-sided, overlay copying operation is done by adjusting the position of the cross-ways registration paper edge sensor (Q16).

Note 1: This adjustment is carried out when registration in first copying is normal and after checking that oblique motion is not occurring during the paper feed operation in second-side copying.

Example: When second-side copying operation take takes place under conditions shown in socket screw and slide the sensor in the direction of the arrow to the fourth calibration.

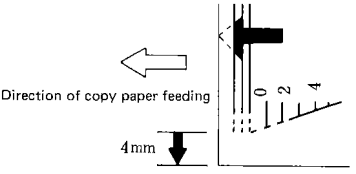

Figure 5-368a

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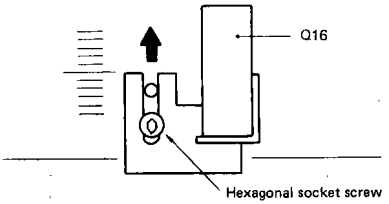

Figure 5-368b

4. Adjusting positions of the home position sensor plate and cam of the cross-registration clutch assembly.

When installing the home position sensor plate of the cross-registration clutch assembly, align point A of the home position sensor plate to point B of the cam in a direction parallel to the axis of the clutch shaft, as shown in Figure 5-368b. Secure the home position sensor plate with hexagonal socket set screws.

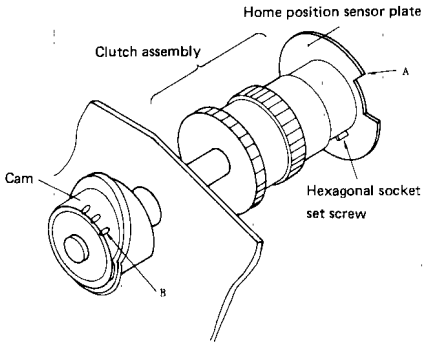

Figure 5-368c

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IV. EXPOSURE SYSTEM

A. Scanner Unit

1. Removing the thermal fuse

1) Remove the copyboard glass.
2) Remove the top cover.
3) Move the mirror 1 mount about 8 cm from the home position.
4) Unscrew the two mounting screws and remove the thermal fuse.

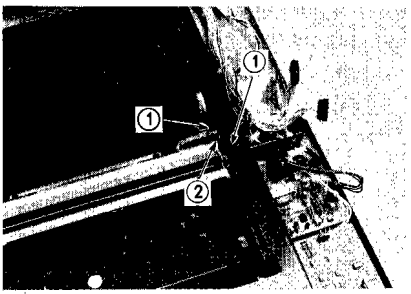

Figure 5-400

① Mounting screw ② Thermal fuse

2. Removing the scanning lamp

1) Mark the position of the rear side reflector, and remove the rear side reflector.

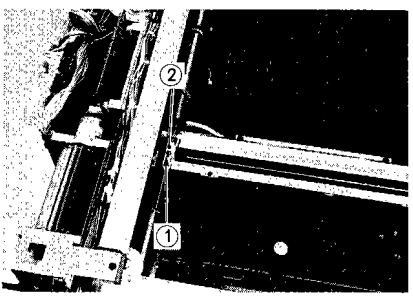

Figure 5-401

① Mounting screw ② Side reflector

2) Loosen the mounting screw on the lamp support (rear) and remove the scanning lamp.

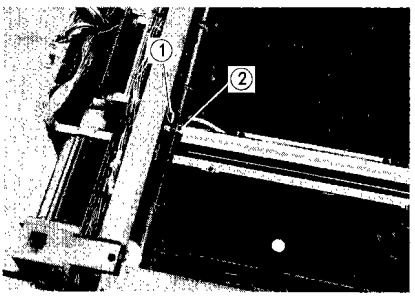

Figure 5-402

① Mounting screw ② Scanning lamp

Notes:

1. Do not remove the scanning lamp until it has cooled.
2. Do not touch the scanning lamp with the bare hand.
3. If the surface of the lamp is dirty, wipe it with a clean, dry cloth.

3. Adjusting the position of the side reflector

As the front or rear side reflector on the mirror 1 mount is moved in the direction indicated by the arrow in Figure 5-403, the front or rear end of the copy becomes increasingly darker.

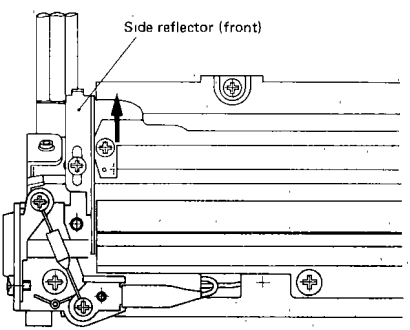

Figure 5-403

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B. Pre-conditioning Exposure Lamp

1. Removing the pre-conditioning exposure lamp

1) Remove the rear panel.
2) Remove the screw and swing out the DC controller PCB.
3) Disconnect connector J33.
4) Unscrew the mounting screw and pull out the pre-conditioning exposure lamp.

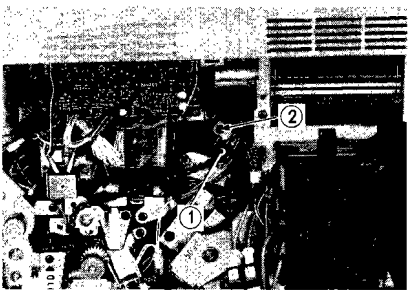

Figure 5-404

① Connector ② Mounting screw

C. Blank Exposure Lamp

1. Removing the blank exposure lamp (NP-3725/3525)

1) Remove the photosensitive drum.
2) Remove the rear panel.
3) Remove the screw and swing out the DC controller PCB.
4) Disconnect connector J50.
5) Remove the connector PCB.
6) Unscrew the mounting screw and remove the plate spring.
7) Pull out the blank exposure lamp.

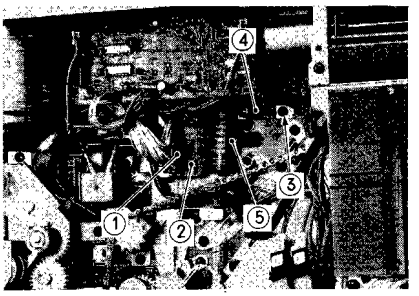

Figure 5-405

1 Connector
2 Connector PCB
3 Mounting screw
4 Plate spring
5 Blank exposure lamp

2. Removing the blank exposure lamp (NP-3225/3025)

1) Remove the photosensitive drum.
2) Remove the rear panel.
3) Remove the screw and swing out the DC controller PCB.
4) Disconnect connectors J72 and J73.
5) Unscrew the mounting screw and remove the plate spring.
6) Pull out the blank exposure lamp.

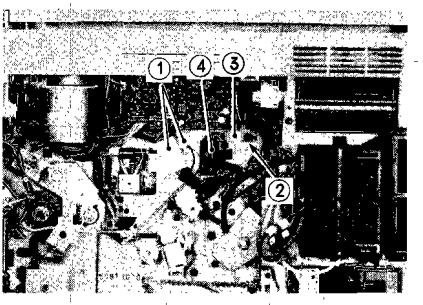

Figure 5-406

① Connectors
② Mounting screw
③ Plate spring
④ Blank exposure lamp

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V. CHARGING SYSTEM

A. Drum Unit

1. Removing the drum unit

1) Open the front door.
2) Release the feeder assembly.
3) Remove the pre-transfer corona assembly.
4) Swing out the black toner hopper.
5) Use a screwdriver to turn the cam shaft counterclockwise, and release the black developing assembly.

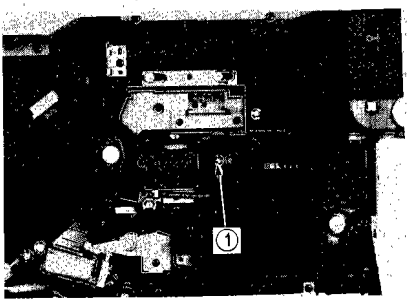

Figure 5-500

① Cam shaft

6) Unscrew the thumbscrew and pull out the drum unit.

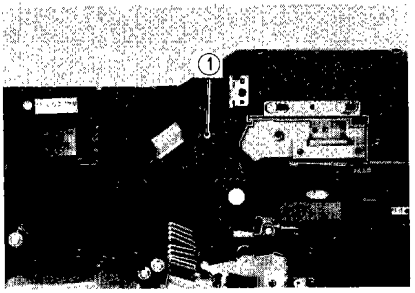

Figure 5-501

① Thumbscrew

7) Grasp the handles and remove the drum unit.

1. The photosensitive drum is very sensitive to strong light, and there will be blank areas and black bands on the copy paper if it is exposed to strong light for too long a time. Whenever the drum is removed from the copier, cover it and place it in a location where it is not directly exposed to sunlight.
2. Do not place hands on the drum separation claws when installing the drum unit, as the claws are withdrawn automatically.
3. Confirm that the drum separation claws are in contact with the drum after installing the drum unit.

Note:

Normal room light, measured a few meters from a window on an average day, is about 1500 lux. Do not expose the photosensitive drum to light of this intensity for more than 5 min. If the drum is placed under these conditions accidentally, the drum unit can be stored in a dark place to "recuperate", although an image may be retained on the drum for some time. Direct sunlight is 10,000 – 13,000 lux, and the drum must never be exposed to direct sunlight.

2. Cleaning

If the surface of the photosensitive drum is dirty, wipe it with a flannel cloth to which toner has been applied. (Do not use lint-free paper.)

Never clean the drum by dry-wiping it or using cleaning solvents.

Never use drum cleaning powders on the drum.

3. Replacing the drum unit

When the drum unit is replaced, record the date and the current counter reading on a label like the one shown in Figure 5-502. Attach the label to the front end of the new drum.

日付 date date Datum	カウンター counter compteur Zähler	備考 notes note Notiz

Figure 5-502

B. Corona Assemblies

1. Outline

There are three corona assemblies located around the photosensitive drum: the primary, pre-transfer, and transfer/separation corona assemblies.

The primary corona assembly has a grid of 8 corona wires that are 0.1 mm in diameter. All other wires in the corona assemblies are 0.06 mm in diameter. The corona wires are metal plated, except for the grid wires These can be replaced with plated ones when the copier is serviced.

2. Disassembly and assembly

a. Removing the primary corona assembly

1) Pull out the drum unit.
2) Unscrew the mounting screw and remove the wire cleaner.

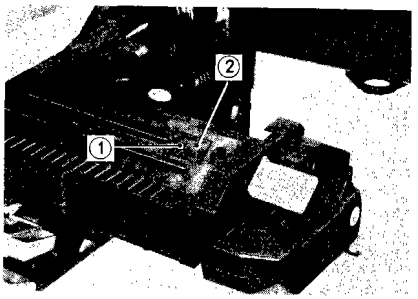

Figure 5-503

① Mounting screw ② Wire cleaner

3) Pull out the primary corona assembly

b. Removing the transfer/separation corona assembly

1) Open the front door.
2) Unscrew the mounting screw and pull out the wire cleaner.

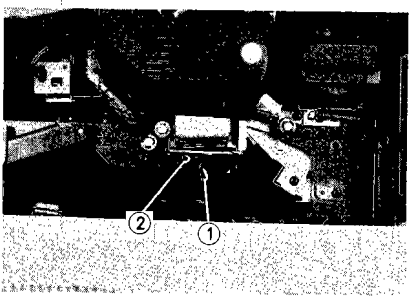

Figure 5-504

① Mounting screw ② Wire cleaner

3) Release the feeder assembly.
4) Pull out the transfer/separation corona assembly.

c. Tensioning the corona wires of the primary, pre-transfer, and transfer/separation corona assemblies.

1) For the primary corona assembly, remove the side plate. For the transfer/separation corona assembly, remove the paper guides.
2) Use a screwdriver to remove the plastic sheets from the blocks at each end of the corona assembly.
3) Unwind about 40 mm of 0.06 mm corona wire from the reel, and make a loop about 2 mm in diameter at the end of the wire.

Note:
To make the loop, wind the corona wire once around a hex (Allen) key and twist the key 3 or 4 times.

4) Use wire cutters to cut off the loose end of the twisted corona wire (excess wire) so that is 1 mm or less.
5) Attach the loop of wire as shown in Figure 5-505, and run the corona wire through the V groove in the height adjustment block.
Hook the tension spring (at position shown in Figure 5-505) on the wire, and twist the spring 3 or 4 times.

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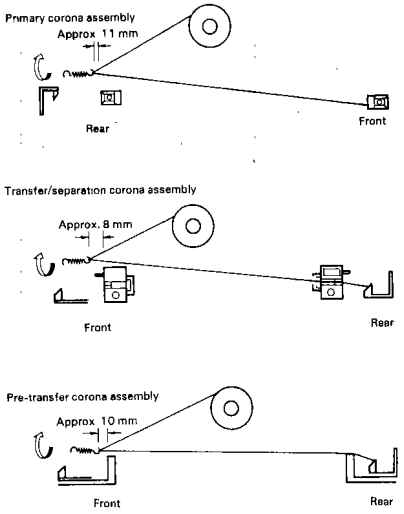

Figure 5-505

6) Use wire cutters to cut the excess corona wire to 1 mm or less.
7) Grasp the end of the corona wire tension spring with tweezers, pull the spring to the corona electrode, and hook it.

Note:
Check the following:
- The wires should be free of kinds, bends and peeled plating.
- There should be no slack in the wires.
- The corona wires should be inserted in the V groove of the height adjustment block.

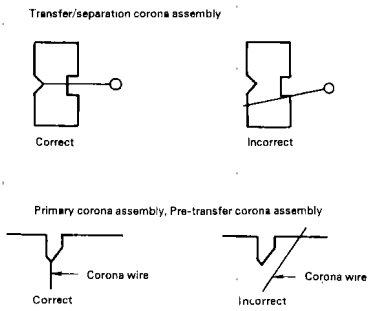

Figure 5-506

d. Tensioning the grid wires of the primary corona assembly

1) Loosen the three mounting screws that secure the front block, move the block in the direction indicated by the arrow in Figure 5-507, and secure it temporarily.

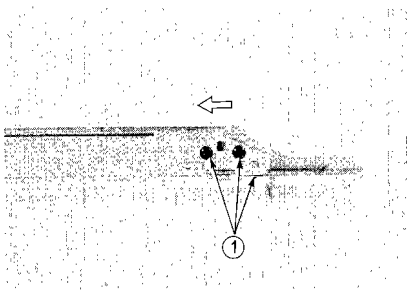

Figure 5-507

① Mounting screws

2) Unwind 0.1 mm corona wire from the reel, and make a loop about 2 mm in diameter at the end of the wire.

Note:
To make the loop, wind the corona wire once around a hex (Allen) key and twist the key 4 or 5 times.

3) Use wire cutters to cut off the excess wire at the loose end of the twisted loop so that the excess is 1 mm or less.
4) Fit the loop over the stud shown in Figure 5-508, and follow the numbered sequence to string the wire.
5) After stringing 8 lines of wire as shown in Figure 5-508, wind the end of the wire around the mounting screw and fix it in place.
6) Use wire cutters to cut the excess corona wire to 1 mm or less.
7) Loosen the three screws that were temporarily tightened in step 1), and move the block in the opposite direction of the arrow in Figure 5-507, until the tension of the grid wires is uniform.
8) Dry-wipe the grid wires.
9) Check the following:
The grid wires should be free of kinds, bends and peeled plating.
The distance between each pair of wires should be uniform.

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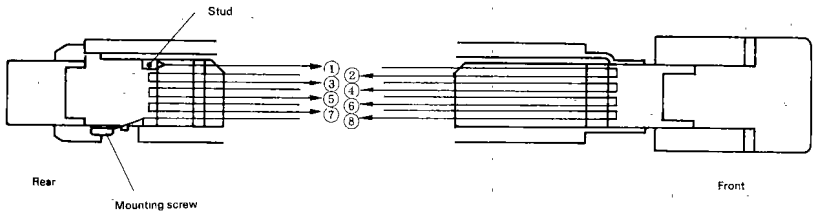


Figure 5-508

3. Adjusting the height of the corona wires

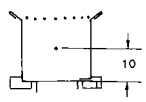
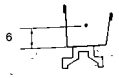
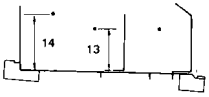
Corona assembly	Standard position	Adjustable range
Primary	Value indicated on label 	±2 mm
Pre-transfer		–
Transfer	Value indicated on label	
Separation	Value indicated on the label 	±2 mm

Table 5-500

Note:
The height (position) of each corona wire can be adjusted by turning the screws at the rear of the corona assembly. For each turn of the screw, the wire position changes by about 0.7 mm.

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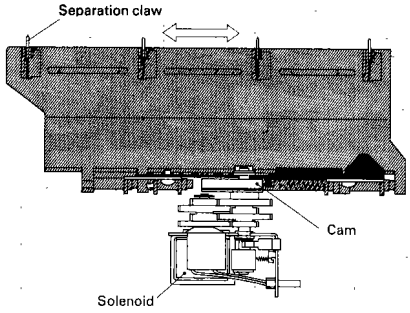
C. Drum Separation Claws

1. Construction



The shaded area moves back and forth.

Figure 5-509 Top view

The separation claws move back and forth (16 mm) in the direction parallel to the axis of the photosensitive drum shaft.

2. Removing the separation claw unit

1) Open the front door.
2) Remove the photosensitive drum.
3) Disconnect connector.
4) Unscrew the mounting screw and remove the separation claw unit.

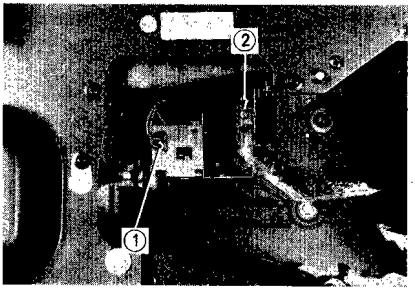


Figure 5-510

① Connector ② Mounting screw

3. Positioning the drum separation claw solenoid (SL14)

Install the solenoid so that its plunger stroke is 2 ± 0.1 mm.

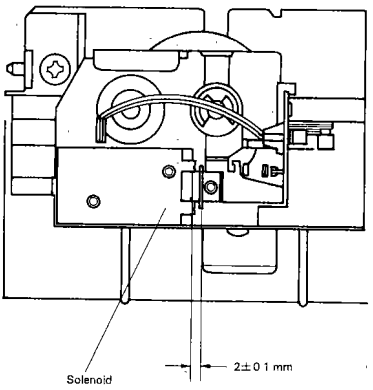


Figure 5-511

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VI. DEVELOPING SYSTEM

A. Black Developing Assembly

1. Construction

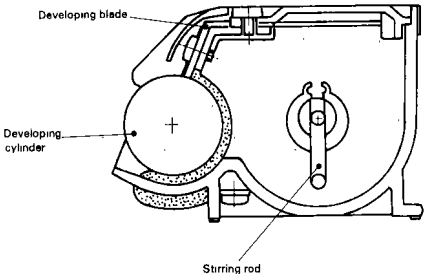

Figure 5-600

2. Removing the black developing assembly

1) Open the front door.
2) Swing out the black toner hopper.
3) Unscrew the two mounting screws and remove the counter cover.

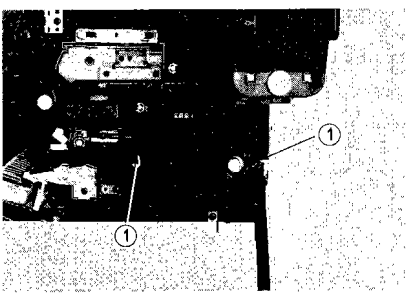

Figure 5-601

① Mounting screw

4) Use a Phillips screwdriver to turn the cam shaft of the developing assembly counterclockwise to release the black developing assembly.
5) Disconnect the connector and unscrew the mounting screw.

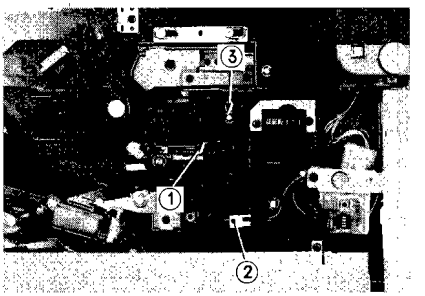

Figure 5-602

① Mounting screw ② Connector ③ Cam shaft

6) Gently pull the black developing assembly toward the front, and then support it from the bottom while removing it.

Note:
Do not grasp the developing assembly or toner may mash against and stick to the developing cylinder.

3. Removing the blade, developing cylinder, and side seals

1) Remove the developing assembly from the copier.
2) Unscrew the mounting screw and remove the grip.

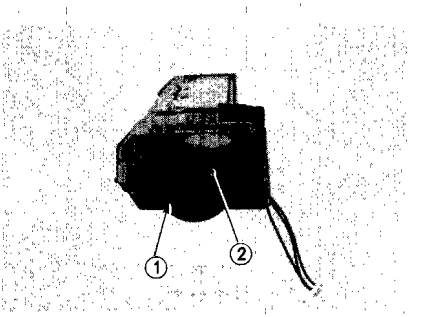

Figure 5-603

① Mounting screw ② Grip

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3) Unscrew the four mounting screws and remove the developing assembly lid.

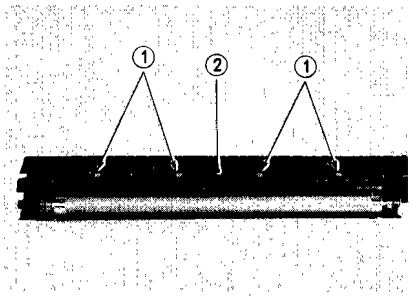

Figure 5-604

① Mounting screws ② Lid

4) Empty the toner onto a piece of newspaper.
5) Unscrew the five mounting screws and remove the blade.

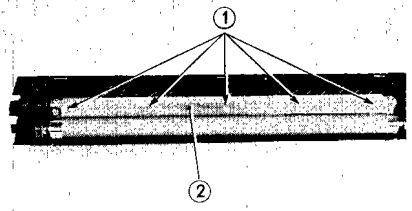

Figure 5-605

① Mounting screws ② Blade

6) Remove the two grip rings, the three gears and the rear spacer roller.

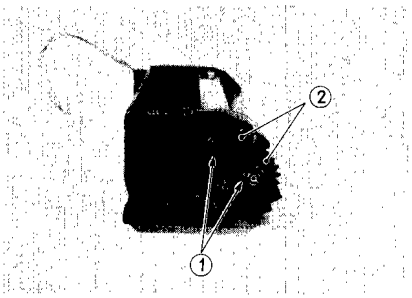

Figure 5-606

① Grip rings ② Gears

7) Unscrew the three mounting screws and remove the electrode plate and the ball bearings.

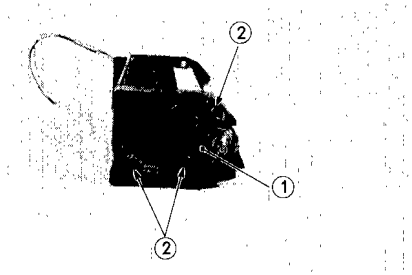

Figure 5-607

① Electrode plate ② Mounting screws

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8) Unscrew the mounting screw and remove the magnet mounting plate.

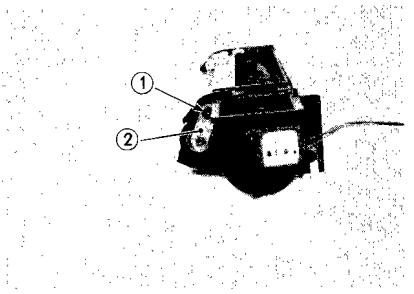

Figure 5-608

① Mounting screw ② Magnet mounting plate

9) Remove the grip ring, the front spacer roller, and the ball bearings.

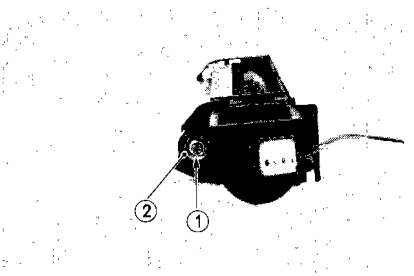

Figure 5-609

① Grip ring ② Spacer roller

10) Remove the developing cylinder.
11) Unscrew the mounting screw and strip off the side seals (front and rear).

Note:
If the side seals do not come off cleanly, apply alcohol.

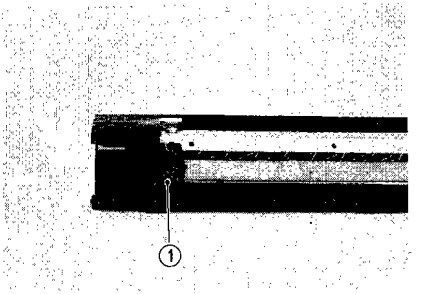

Figure 5-610

① Side seals

4. Attaching the side seals

1) Remove the blade mounting plate.

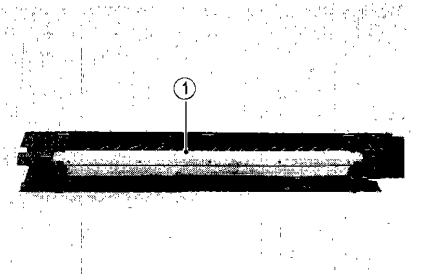

Figure 5-611

① Blade mounting plate

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2) Peel off the backing tape from the side seal, and lightly tighten the screw to hold the side seal in place.
3) Align the side seal with the inside wall edge of the developing assembly, and attach the seal securely.

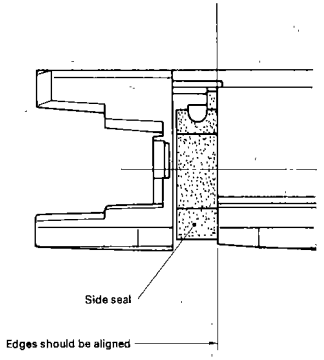

Figure 5-612

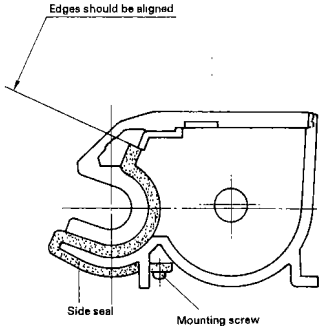

Figure 5-613

5. Installing the developing cylinder

Installation is the reverse procedure of removal. However, note the following:

Notes:

1. The longer end of the shaft of the developing cylinder goes to the rear of the copier.
2. Be careful not to get fingerprints or oil on the surface of the developing cylinder. However, if this should occur, dry-wipe the cylinder with lint-free paper.
3. If areas that have been dry wiped produce a fainter image, wipe them again with lint-free paper that has been moistened with water. Do not use cleaning solvents.
4. Clearance between the blade and developing cylinder is determined by the scrapers at each end of the blade. The scrapers contact the developing cylinder to hold the blade the specified distance away from the cylinder. The clearance between the blade and developing cylinder should be uniform along the length of the blade. To install the scrapers, hold them against the blade and secure them with screws.

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B. CD Unit

1. Construction

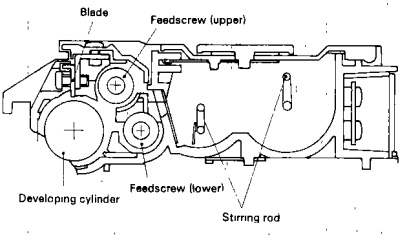

Figure 5-614

Note:
If the developing cylinder is removed, the proportion of iron powder (carrier) to toner in the developing mixture will be altered. Since this will cause image deterioration such as fogging and fading, the developing cylinder should not be removed or replaced.

2. Adjusting the position of the color toner supply solenoid (SL3)

Move the slide plate all the way over in the direction indicated by A. Move the solenoid all the way over in the A direction, and fasten it in place.

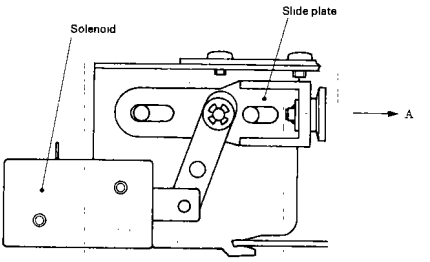

Figure 5-615

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VII. FIXING SYSTEM

A. Fixing Assembly

1. Construction

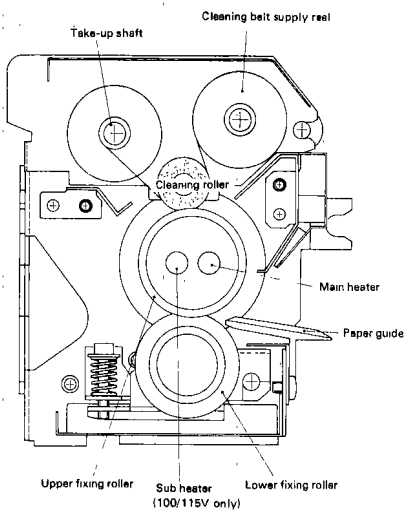

Figure 5-700

2. Pressure mechanism

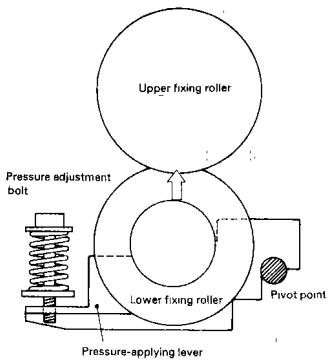

Figure 5-701

The position of the pressure-applying lever, shown in Figure 5-701, is changed by turning the pressure adjustment bolts at the front and the rear of the fixing assembly.

When the pressure adjustment bolts are turned clockwise, the lower fixing roller moves in the direction of the arrow and the fixing roller pressure increases.

3. Disassembly and assembly

a. Removing the fixing assembly

1) Open the front door and the delivery assembly.
2) Unscrew the screw and remove the fixing assembly knob.
3) Remove the left rear panel.
4) Disconnect fixing assembly connectors J2 and J32.
5) Unscrew the two mounting screws and remove the fixing assembly.

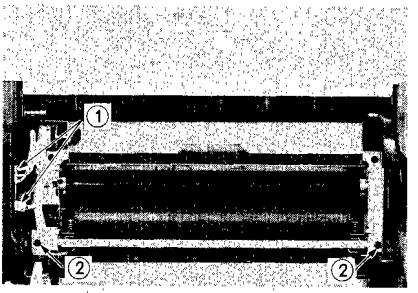

Figure 5-702

① Connectors ② Mounting screw

b. Removing the heaters, upper fixing roller and lower fixing roller

1) Remove the fixing assembly from the copier.
2) Unscrew the mounting screws and remove the fixing assembly cleaning assembly.

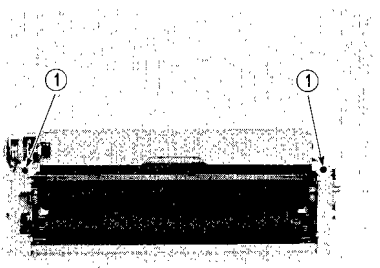

Figure 5-703

① Mounting screw

■ Rear side

3) Remove the sub heater terminal mounting plate (2 mounting screws) and gently pull out the sub heater. Only 100/115V copiers have a sub heater, so this step is not required for 220/240V copiers.

4) Remove the main heater terminal mounting plate (2 mounting screws) and slowly pull out the main heater.

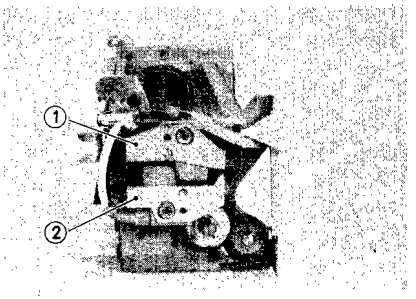

Figure 5-704

① Sub heater terminal mounting plate (100/115V only)
② Main heater terminal mounting plate

5) Remove the C-ring for the upper fixing roller shaft gear (rear side) and remove the gear.

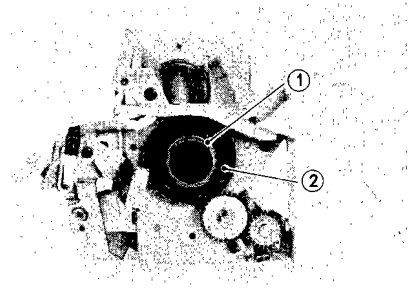

Figure 5-705

① C-ring
② Upper fixing roller shaft gear (rear side)

■ Front side

6) Unscrew the two mounting screws and remove the heater terminal mounting plate.
7) Remove the grip ring and gear (22T).

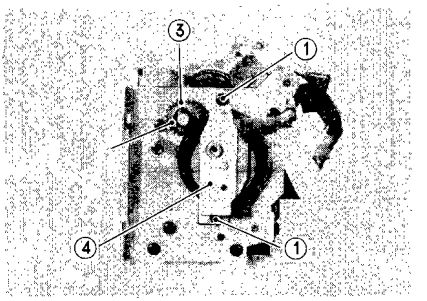

Figure 5-706

① Mounting screw
② Grip ring
③ Gear (22T)
④ Heater terminal mounting plate

8) Remove the C-ring for the upper fixing roller shaft gear (front side) and remove the gear.

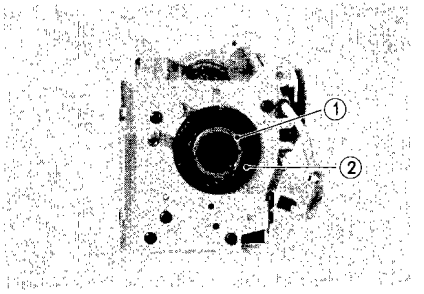

Figure 5-707

① C-ring
② Upper fixing roller shaft gear (front side)

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9) Remove the insulated bushings from the front and rear side. Remove the bearing from the front side.
Pull the upper fixing roller out slowly from the upper roller bearing hole on the front side.

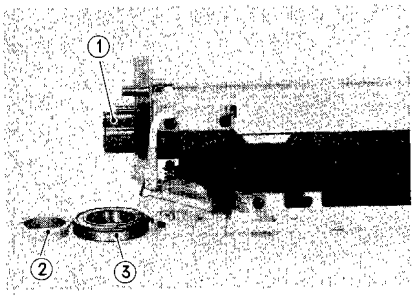


Figure 5-708

① Upper roller
② Insulated bushings
③ Bearing

10) Pull the paper guide forward and out.
11) Lift the lower roller up from the bearing and remove it slowly.

c. Installing the heaters and the upper fixing roller

Installation is the reverse procedure of removal. However, note the following precautions:

- Handling the heaters
  Do not touch the heaters directly with the hands.
- Handling the upper roller
  The roller should be wrapped in copy paper or a protective covering to prevent it form becoming dirty or scratched.

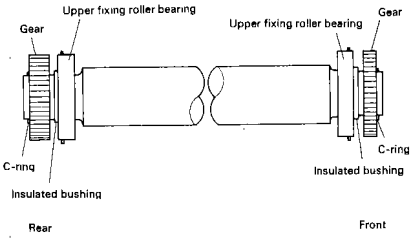
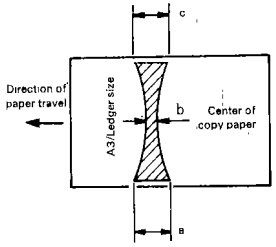


Figure 5-709

4. Adjusting the nip width

(Tightening the pressure adjustment bolts)

The nip width should be within the range shown in Table 5-700. If it is outside the specified value, adjust the bolts.



Note:
a and c are the measurements at a point 10 mm from the edges of the copy paper.

Figure 5-710

Dimensions	Measurements should be made after the upper and lower fixing rollers have heated up completely.
b	4.5 ± 0.5 (mm)
|a−c|	0.5 mm max.

Table 5-700

■ **Measuring the nip width**

If the rollers are cold when the power is switched ON, wait 15 seconds after the Main/Wait indicator has gone out and then make 20 copies. Then make the measurement.

Measurement procedure

1) Raise the copyboard cover and make a solid black A3/Ledger copy.
2) When the leading edge of the copy paper reaches the copy tray, turn the power switch OFF and open the front door and the delivery assembly.
3) Turn the fixing assembly knob a little in the clockwise direction. Hold it there for 15 seconds, and then turn the knob to feed the copy paper out of the fixing assembly to the delivery tray.
4) Measure the width where the toner has a glossy surface at the locations shown in Figure 5-710.

■ **Installing the thermistor**

Check that the sensing face of the thermistor contacts the surface of the upper fixing roller evenly.

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Note:
It is not necessary to adjust the mounting position of the thermistor. If the contact between the thermistor and the roller is not even, check the thermistor spring for deformation.

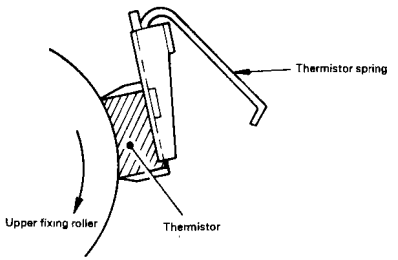

Figure 5-711

■ **Installing the thermal switch**

Check that the sensing face of the thermal switch contacts the surface of the upper fixing roller evenly.

Note:
It is not necessary to adjust the mounting position of the thermal switch. If the contact between the switch and the roller is not even, check the thermal switch spring for deformation.

■ **Position of the paper guide**

The paper guide is pulled forward to separate it from the fixing assembly. Reverse the procedure to reinstall it.

It is not necessary to adjust the position of the paper guide.

Notes:
1. If the paper guide mount has been removed, the paper guide position must be readjusted. To avoid this, do not loosen the screws on the paper guide mount. If they must be loosened for some reason, mark the position of the mount before removal.
2. To adjust the paper guide position, place the fixing assembly at the edge of a desk or table as shown in Figure 5-712 and move the paper guide mount until the distance between the edge of the table and the paper guide is 39 ±0.3 mm.

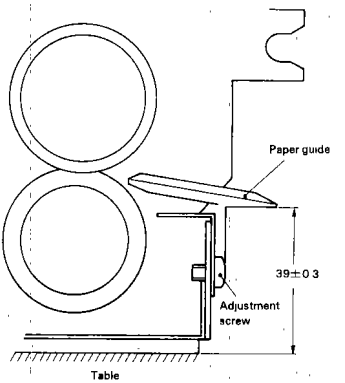

Figure 5-712

5. Lubrication

Periodically apply heat-resistant grease to the following parts:
- Places where gears mesh (Rear)
- Places where gears for fixing assembly knob mesh (Front)

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B. Cleaning Assembly

1. Outline

The cleaning assembly is mounted on top of the fixing assembly. It holds a cleaning belt that is impregnated with silicone oil against the upper fixing roller to clean the roller.

The cleaning belt is 15 m long. The last 2.5 m has a red band to indicate that the cleaning belt is almost used up.

2. Disassembly and reassembly

a. Removing the cleaning belt

1) Remove the fixing assembly.
2) Unscrew the mounting screws and remove the cleaning assembly. (Refer to Figure 5-703.)
3) Remove the cleaning assembly bearings (one mounting screw each), and remove the cleaning belt.

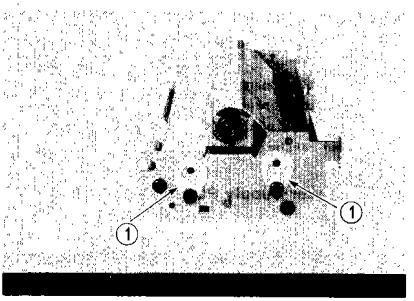

Figure 5-713

①Bearing

b. Installing the cleaning belt

The supply and take-up reels and the cleaning belt form a single unit.

Installation is the reverse procedure of removal. However, note the following:

Wind the belt two or three turns around the take-up reel. Check that the part of the belt that contacts the fixing roller is impregnated with oil. Check that the belt is being wound straight, and that there are no wrinkles or slack.

c. Positioning the cleaning belt drive solenoid (SL4)

Move the lever in the direction indicated by A, and secure the solenoid so that the distance shown in Figure 5-714 is 0.3 ± 0.1 mm.

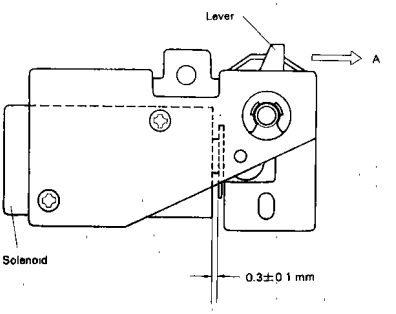

Figure 5-714

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VIII. ELECTRICAL SYSTEM

A. High-voltage Transformer

1. Removing the high-voltage transformer

1) Remove the rear panel.
2) Unscrew the screw on the mounting plate of the DC controller PCB, and swing out the DC controller PCB.

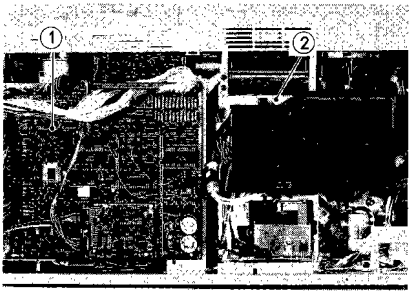

Figure 5-800

① DC controller PCB ② High-voltage transformer

3) Disconnect transformer connectors J2, J3 and J4 (high-voltage connectors).
4) Disconnect the transformer ground wire and remove the toothed lockwasher (one screw).
5) Unscrew the two mounting screws and remove the high-voltage transformer.

2. Installing the high-voltage transformer

Installation is the reverse procedure of removal. The positions of the high-voltage cables and ground wire are shown in Figure 5-801.

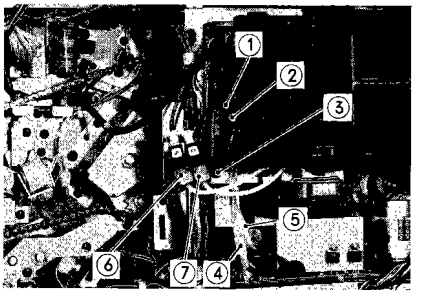

Figure 5-801

① For transfer corona assembly (Green)
② For primary corona assembly (Blue)
③ Ground terminal
④ For DC component of separation assembly
⑤ For DC component of pre-transfer corona assembly
⑥ For separation corona assembly
⑦ For pre-transfer corona assembly

B. DC Power Supply PCB

1) Remove the right panel and the rear panel.
2) Unscrew the mounting screw and swing out the DC controller PCB. (Refer to Figure 5-802.)
3) Disconnect all the connectors from the DC power supply PCB.
4) Remove the 6 mounting screws and remove the DC power supply PCB.

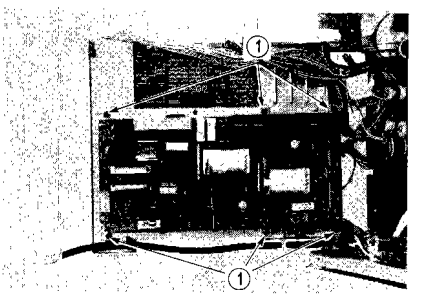

Figure 5-802

① Mounting screws

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C. DC Controller PCB

The DC controller PCB has a lithium battery to provide back-up power for the RAM. Note the following to prevent the battery terminals from making improper electrical connection or from becoming disconnected.

1. Removing the DC controller PCB

Remove the DC controller PCB together with the insulating sheet.

2. Transporting the DC controller PCB

When sending the DC controller back to the service workshop or factory, make sure the insulating sheet is attached and place the DC controller in an electrically conducting bag. One side of the conducting bag is transparent. The component side of the DC controller should be placed facing this side.

The service mode settings (which are stored in memory), the two stored reproduction ratios, and the area memory coordinates need to be reset when a new DC controller is installed.

For details on the service mode settings, refer to page 4-30.

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IX. OPTIONS

A. Paper Deck Unit

1. Removing the paper deck unit

1) Remove the right panel.
2) Open the paper-filling door and push the lifter deck down.
3) Remove the copy paper from the paper deck.
4) Unscrew the two mounting screws and remove the paper deck.

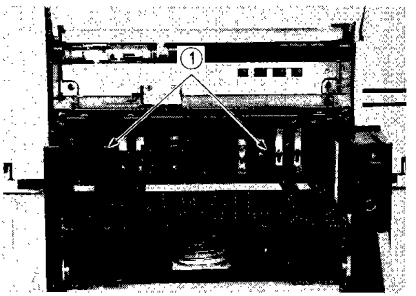

Figure 5-900

① Mounting screws

2. Removing the drive unit

1) Remove the paper deck from the copier.
2) Unscrew the three mounting screws and remove the paper-filling door.

Note:
Be careful not to lose the two spacers.

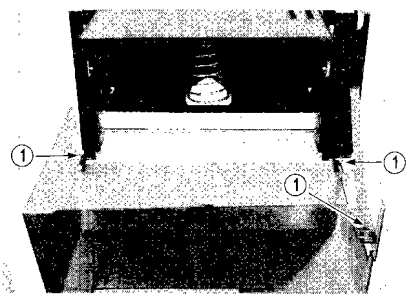

Figure 5-901

① Mounting screws

3) Unscrew the two mounting screws and remove the cover.

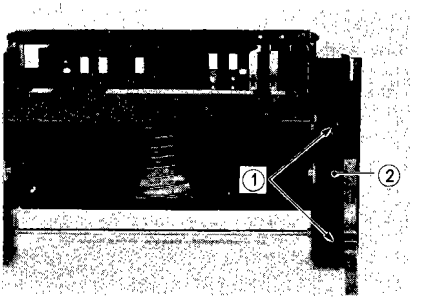

Figure 5-902

① Mounting screws ② Cover

4) Remove the two springs and the E-ring, and remove the drive unit.

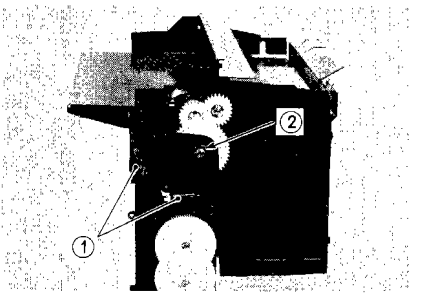

Figure 5-903

① Springs ② E-ring

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3. Standard spring pressure

If the pressure from the spring that raises the lifter deck is not correct, paper pick-up problems may occur.

If there are any problems with paper pick-up, check the spring pressure. If it does not correspond to specifications, replace the spring.

■ **Paper deck for the NP-3725/3525**

1) Lower the lifter deck and close the paper-filling door.
2) Check whether the position at which the lifter deck stops rising corresponds to the position shown in Figure 5-904.
   If the position is not correct, adjust it with the adjustment screw.

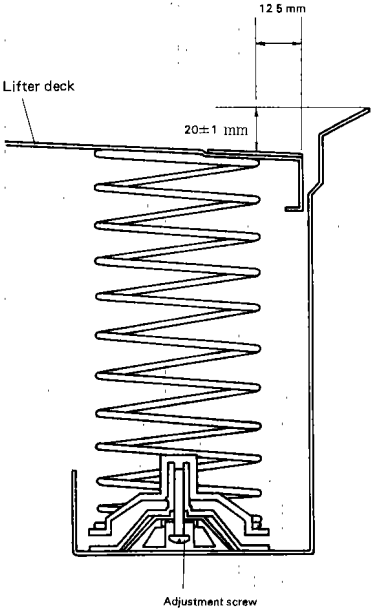

Figure 5-904

■ **Paper deck for the NP-3225/3025**

1) Push the lifter deck down with the spring gauge as shown in Figure 5-905. Check whether the pressure is in the range shown in Table 5-900.
2) Place 1000 sheets on the lifter deck, push the sheets down with the spring gauge as shown Figure 5-905. Check whether the pressure is in the range shown in Table 5-900.

If the pressure is not correct, adjust it with the adjustment screw.

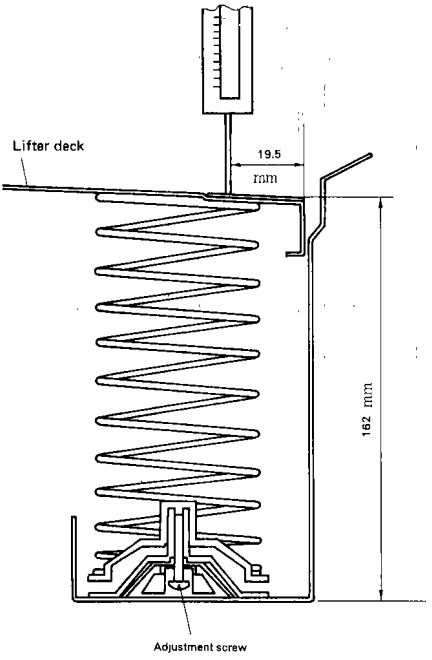

Figure 5-905

Number of sheets in stack	Spring pressure
0	540 ± 10g
1000	420 ± 120g

Table 5-900

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B. Image Editing Unit

1. Removing the image editing unit

1) Remove the right panel and the rear panel.
2) Remove the cord-hole plate and the ground wire of the image editing unit.

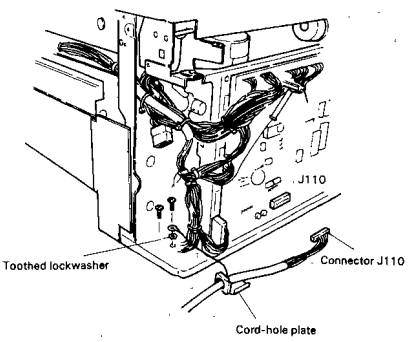

Figure 5-906

3) Disconnect connector J110 from the DC controller PCB.
4) Remove the image editing unit.

C. Sorter MS-3

1. Removing sorter MS-3

1) Remove the rear panel of the copier.
2) Remove the cord mounting plate.

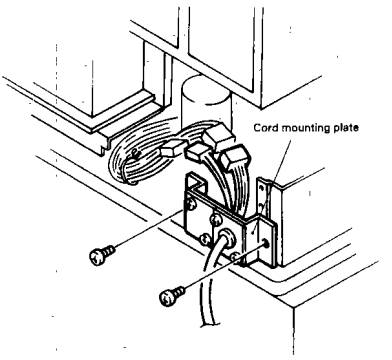

Figure 5-907

3) Disconnect the 3-pin connector and the 15-pin connector that connects the MS-3 sorter to the copier.

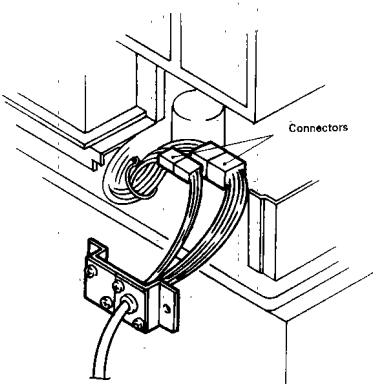

Figure 5-908

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4) Remove the safety stop plate from the mounting plate (front).

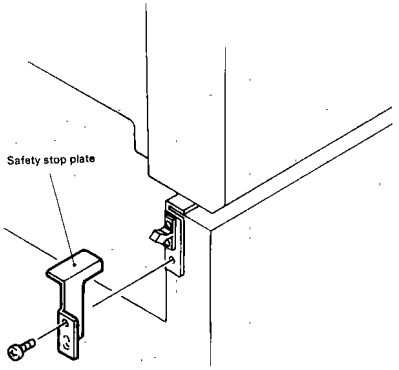

Figure 5-909

5) Pull the sorter out approximately 18 cm from the copier. Lift it up and pull it out.

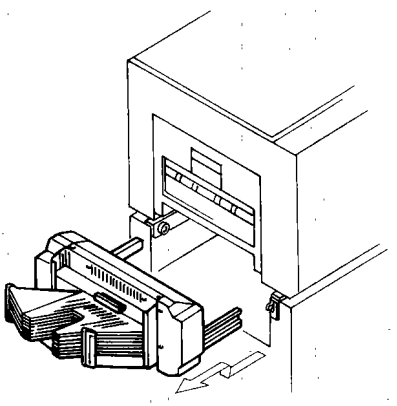

Figure 5-910

D. DF-IV

1. Removing the DF-IV

1) Remove the rear panel.
2) Disconnect connectors JR1 (15P) and JR2 (4P) and the ground wire (GND).

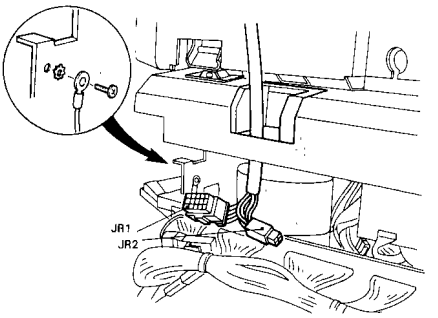

Figure 5-911

3) Unscrew the mounting screw and remove the cord hole cover by pulling it in the direction of the arrow.

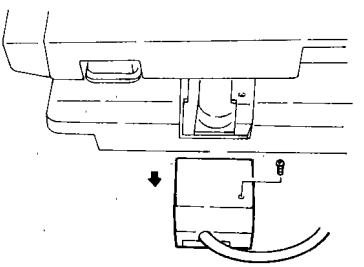

Figure 5-912

4) Grasp the DF-IV with both hands and remove it from the copier.

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E. Duplexing unit

1. Removing the duplexing unit

1) Remove the rear panel and left rear panel of the copier. Open the front door.
2) Remove the cable holder and disconnect connectors 10P, 5P and 4P.

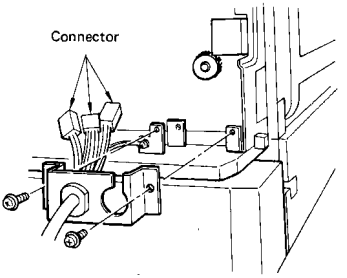

Figure 5-913

3) Remove the ground terminal.

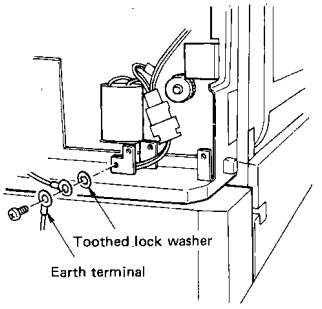

Figure 5-914

4) Remove the stop plate and pull out the duplexing unit.

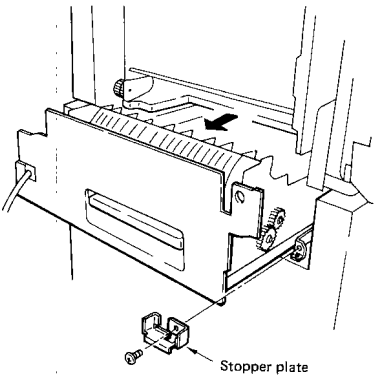

Figure 5-915

2. Outline of paper pick-up assembly in the duplexing unit

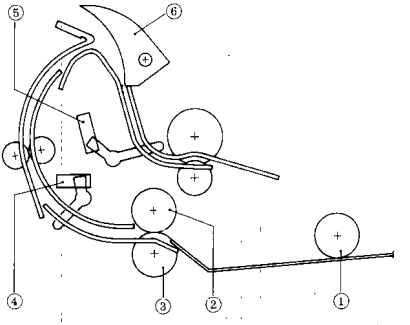

Figure 5-916

① Paper pick-up roller
② Feed roller
③ Separation roller
④ Duplexing unit paper-out sensor
⑤ Duplexing unit paper-in sensor
⑥ Paper deflector

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3. Removing the pick-up rollers of the duplexing unit pick-up assembly

1) Pull the duplexing unit from the copier.
2) Remove the belt tension plate. (one screw)

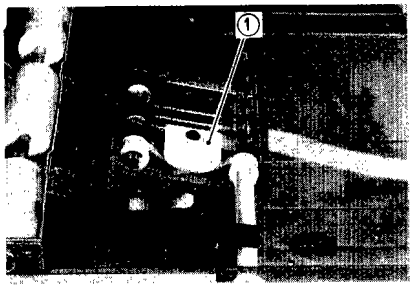

Figure 5-917

① Belt tension plate

3) Remove the two E-rings and shift the pick-up roller towards the center.

Note: Be careful not to lose the pin.

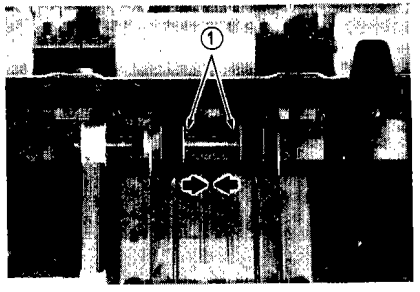

Figure 5-918

① E-ring

4) Remove the two E-rings.
5) Move the shaft in the direction shown in the figure and remove the pick-up roller.

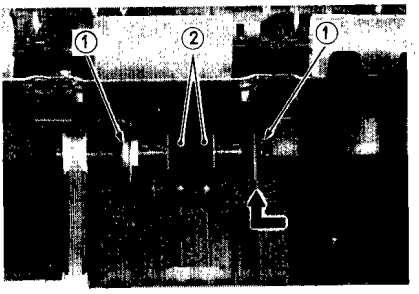

Figure 5-919

① E-ring
② Pick-up roller of duplexing unit pick-up assembly

4. Removing the feed roller of the duplexing unit pick-up assembly.

1) Remove the duplexing unit from the copier.
2) Remove the cover. (two screws)

Figure 5-920

① Cover

3) Remove the E-ring and the bushing.
4) Remove the paper deflector with the shaft.

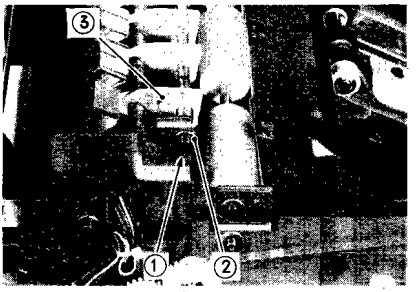

Figure 5-921

① E-ring ② Bushing ③ Paper deflector

5) Remove the two E-rings and the two bushings. Remove the upper feeder roller together with the shaft.
6) Unscrew the two screws and remove the guide plate as shown in the figure.

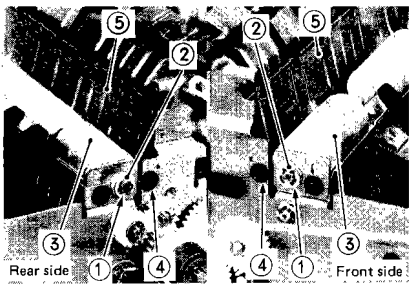

Figure 5-922

① E-rings
② Bushings
③ Feeder roller
④ Screws
⑤ Guide plate

7) Unscrew the two screws. Remove the two screws and pull out the guide plate as shown in the figure.

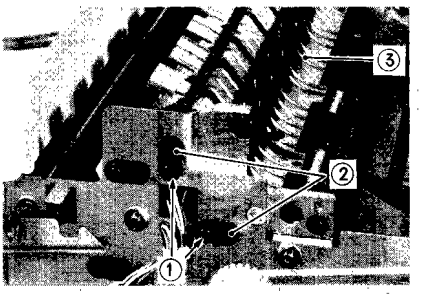

Figure 5-923

① Screw
② Guide plate setscrews
③ Guide plate

8) Disconnect the connector and take out the guide plate.

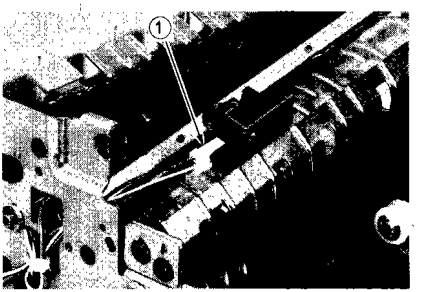

Figure 5-924

① Connector

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9) Make marks around the screws shown in the figure, loosen its screws.

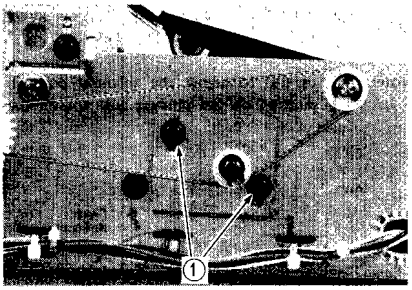


Figure 5-925

① Screws

10) Remove the E-ring and pull out the gear and belt.

Note: Be careful not to lose the pin.

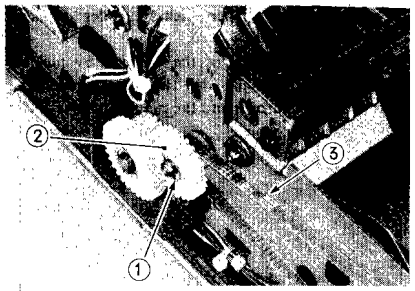


Figure 5-926

① E-ring ② Rear ③ Belt

11) Remove the screw from the clutch unit. Slide the feeder roller and the clutch unit assemblies (including the shaft) of the duplexing unit in the direction of the arrow.

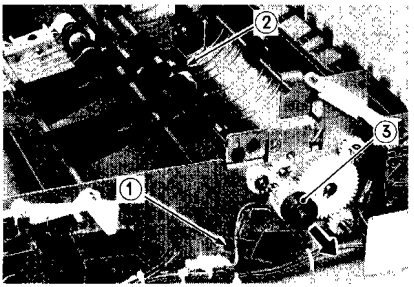
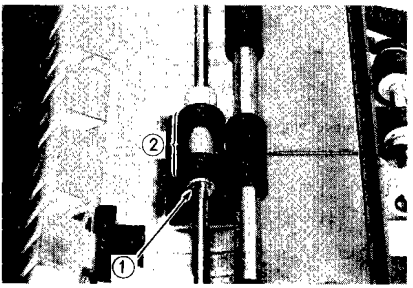


Figure 5-927

① Screw ③ Clutch unit
② Feeder roller of the duplexing unit pick-up assembly

12) Remove the E-ring and remove the feeder roller.



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5. Removing the separation roller of the duplexing unit pick-up assembly

1) Remove the duplexing unit from the copier and place it with the back facing forwards on a table.

Note: Be careful to avoid damaging the paper deflector and paper guide.

2) Remove the two E-rings, the bushing and the spring. Pull out the separation roller mounting plate in the direction of the arrow.

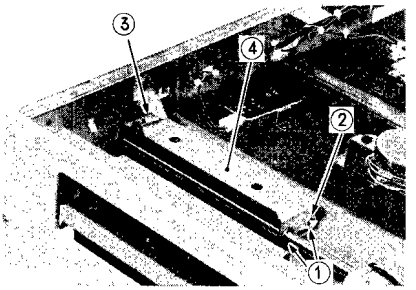

Figure 5-929

① E-ring
② Bushing
③ Spring
④ Separation roller mounting plate

3) Remove the E-ring and remove the separation roller of the duplexing unit pick-up assembly.

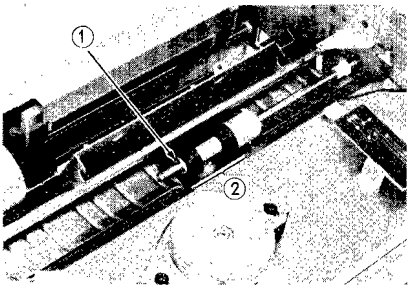

Figure 5-930

① E-ring
② Separation roller of the duplexing unit pick-up

6. Positioning the paper deflector solenoid (HTSL5)

Adjust the position of the solenoid by pushing on the solenoid plunger with the finger so that the distance between the paper deflector and the guide plate is 0.8±0.2mm as shown in the figure.

Note: Be careful to adjust the solenoid position by pushing on the plunger and not on the arm.

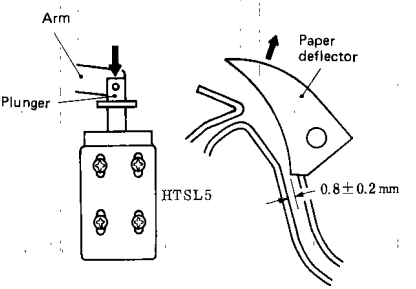

Figure 5-931

7. Positioning the paper pick-up roller pressure solenoid (HTSL6)

Adjust the position of the solenoid by pushing on the solenoid plunger with the finger so that the distance between arm A and the pin of arm B is about 0.5mm.

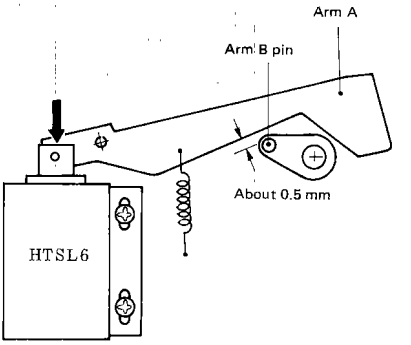

Figure 5-932

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I. SELECTION OF LOCATION

The copier should be installed in a location that meets the following requirements. It is recommended that the service technician personally inspect the customer's premises before installing any copier.

- The location should have an electrical outlet capable of supplying the required power (marked on the rating plate). The supplied voltage should not vary by more than 10% from the required voltage. The copier must be grounded for proper operation.

Note: The copier must be grounded for proper operation. Be sure that the ground pin of a three-pin plug is connected to a grounded terminal.

- The ambient temperature should be within the range from 7.5 to 32.5% (45.5 to 90.5°F), and the relative humidity between and 10 to 85%. The copier should not be installed near water faucets, space heaters, humidifiers, or refreigerator.
- The copier should not be installed close to open flames or in dustry areas, or where it will be exposed to ammonia fumes or direct sunlight. If a location in the sun is unavoidable, place protective curtains across the window.
  The NP-3725/3525 should not be installed where it will be exposed to direct sunlight as the "auto-paper selector" and "auto-enlarger" functions may not operate normally.
- The room should be well-ventilated.
- Make sure the copier is installed on a level surface with all of its feet in contact with the surface.
- The rear of the copier should be at least 10 cm from the wall, with enough space at the ends to permit unrestricted operation.

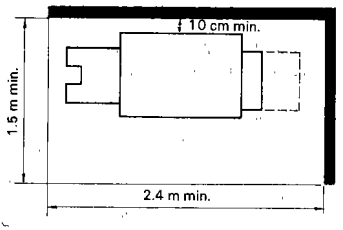

Figure 6-1

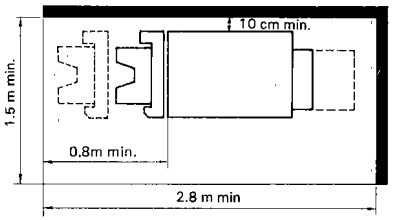

Figure 6-2

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II. UNPACKING AND INSTALLING THE COPIER

If the copier (in its shipping container) is moved from a cold place to a warm place, let it stand for at least one hour before unpacking it, to allow it to warm up. This avoids condensation inside the copier that would affect the image.

No.	Procedure	Check	Remarks
1	Unpack the copier.		
2	Withdraw the four handles from the copier, and use them to lift the copier from its base.		The copier weighs 63 or 73 kg (139 or 161 ℔) and requires four people to lift it.
3	Open the cardboard carton and remove all the parts and materials inside.	Check that the following parts items are present: · Photosensitive drum · Copy delivery tray · Instruction label · Operator's manual · Cassettes · Document tray · Framing scale · Measuring cup	
4	Open the front door, the delivery assembly and swing out the black toner hopper.		
5	Remove the pre-transfer corona assembly.		
6	Remove the two spacers (with identification tags) of the fixing assembly.		
7	Remove the securing screw and the connector from the black developing assembly, and remove the assembly.	Check that the developing cylinder is clean and unscratched.	Refer to Figure 6-3.
8	Remove the color developing assembly (CD unit) from the copier.	Check that the developing cylinder is clean and unscratched.	Refer to Figure 6-3. (NP-3725/3525 only)
9	Release the feeder assembly, remove the fixing part that holds the drum-sepalation claws, and remove the dummy drum.		
10	Add one cartridge of black toner to the black toner hopper.		
11	Open the lid of the black developing assembly.		Refer to Figure 6-4.
12	Remove four measuring cups of the toner from the hopper, and add the toner to the developing assembly.	Check that the toner is evenly distributed over each of the three developing cylinders. Add toner to the toner sensor assembly.	Refer to Figure 6-5.
13	Close the lid of the black developing assembly, and set the developing assembly into the copier.	Fasten the black developing in place with the M3 x 6 screw.	

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No.	Procedure	Check	Remarks
14	Install the drum unit.	· Do not use hands to touch the drum separation claws when installing the drum unit, as they are released automatically. · Confirm that the drum separation claws are in contact with the drum after installing the drum unit.	
15	Pull out and push in the primary and separation/transfer corona assemblies to clean the corona wires.		
16	Wipe off the pre-transfer corona assembly, and install it in the copier.		
17	Mount the copy tray on the copier.		
18	Check that the exterior of the copier has not been scratched or deformed in transit.		
19	Remove the right panel, and mount the document tray.		
20	Remove the rear panel, and check that all gears, sprockets, pulleys, and connectors are properly in place.		
21	Insert the power plug into the outlet and set the power switch to "I".	· Check that the PAPER OUT indicator is lit and that the WAIT indicator lights red. · Press the keys on the INPUT keyboard and the CLEAR/STOP key, and check that the COPY NUMBER display lights correctly. · Check that the other keys operate properly.	
22	Put copy paper in the cassette, and load the cassette into the copier.		
23	Add toner to CD unit and install the CD unit into the copier.		Refer to page 6-7
24	Place a test sheet on the copyboard, make a copy, and check the copy image.	· Check that there are no abnormal noises. · Check the copy image for each fixed reproduction ratio. · Check that the set number of copies is made.	
25	Make a copy in manual feed mode.	· Check that the copying operation is normal.	
26	Set the standard mode as required by the user.		
27	Reattach the rear panel and right panel.		
28	Clean up around the machine.		

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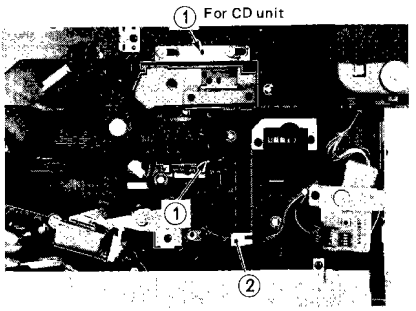
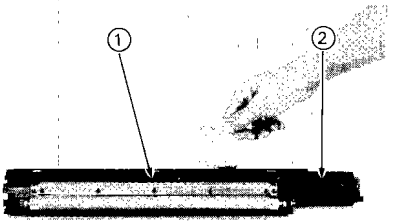
No.	Procedure	Check	Remarks
29	Move the copier to the desired location.	· Check that the copier is level.	
30	Fill out the necessary items on the Service Sheet.		



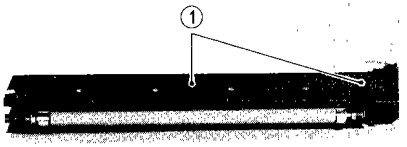
① Securing screw ② Connectors

Figure 6-3



① Developing cylinder part ② Toner sensor part

Figure 6-5



1 Lid

Figure 6-4

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III. MOVING THE COPIER

If it is necessary to move the copier to another location in a truck, etc., the following procedures must be carried out.

No.	Procedure	Check	Remarks
1	Remove the drum unit.	Place the drum unit in its shipping box for transport.	
2	Remove the CD unit	Place the CD unit in its shipping box for transport.	
3	Secure the rail of the CD unit and black developing assembly with screws.		Refer to Figure 6-3
4	Install the "dummy" drum.		
5	Secure all of the corona assemblies, the feeder assembly release lever, and the holding tray release lever in place with tape, so that vibrations do not shake them out of place.		
6	Secure the front door and paper delivery area cover in place with tape.		
7	Place one sheet of A3/Ledger copy paper on the copyboard glass, and secure the copyboard cover with tape.		

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IV. PROCEDURE FOR INSTALLING SOCKET FOR CONTROL COUNTER II AND CONTROL CARD III.

1) Remove the right panel.
2) Remove the two screws and blanking plate.

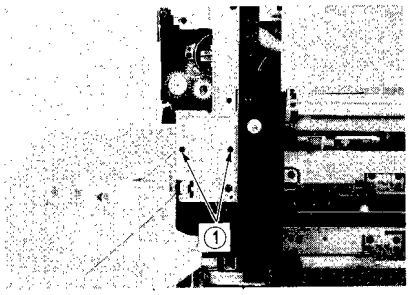

Figure 6-6

① Screws

3) Cut and remove the jumper wire from the 4P connector shown in Figure 6-7.

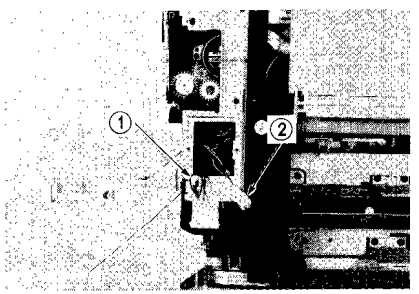

Figure 6-7

① Jumper wire ② 1P connector

4) Connect the socket connector to the 4P connector shown in Figure 6-7.
   For the control card III socket, connect the 1P connector also.
5) Attach the socket using two countersunk screws.

Note:
Attach the socket so that the arrow on it is facing to the left.

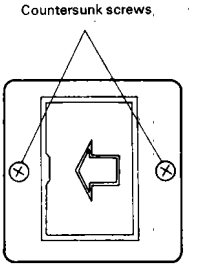

Figure 6-8

6) Cut out the hole for the control counter/card in the right panel, using a knife or other suitable tool.

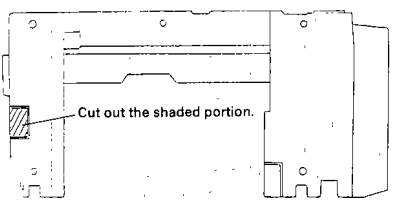

Figure 6-9 Right panel

6) Install the right panel.
7) Insert control counter II or control card III, and check the operation of the copier and the counter.

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V. PROCEDURE FOR INSTALLING THE CD UNIT (COLOR DEVELOPING ASSEMBLY)

1) Remove the two screws and the PCB cover of the CD unit.
   Note: When using the CD unit for red toner, do not do the above.

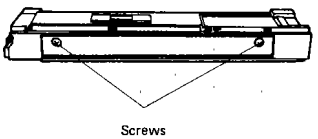

Figure 6-10

2) Cut off the jumper wire (Figure 6-11) on the PCB when installing a CD unit for the color listed.

Jumper pin / Toner color	JP851	JP852	JP853
Red	–	–	–
Blue	–	Cut	–
Sepia	Cut	–	–
Green	–	–	Cut

Figure 6-11

3) Reattach the PCB cover.
4) Remove the four screws and the upper cover of the CD unit.

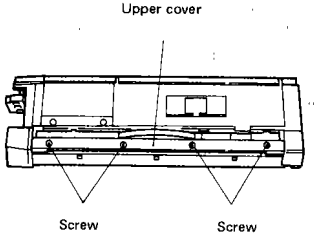

Figure 6-12

5) Unscrew the funnel of the container of start developer.

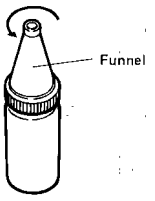

Figure 6-13

6) Peel off the seal from the start developer container.

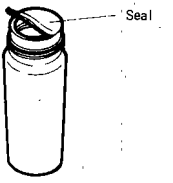

Figure 6-14

7) Reattach the funnel to the start developer container.
8) Distribute the start developer evenly in the slot over the developing cylinder of the CD unit.
   Note: Take care not to spill developer while pouring it.
   Insufficient start developer may cause fogged images.

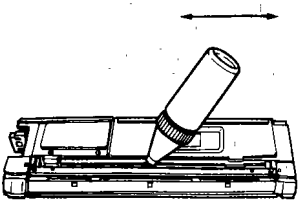

Figure 6-15

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9. Attach the upper cover to the CD unit.
10. Remove the screw and blocking plate.
    Note: Keep the screw and the blocking plate for future use.

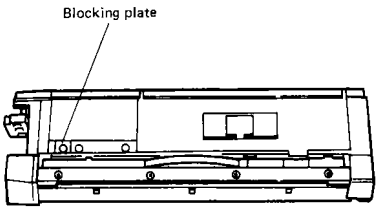

Figure 6-16

11. Install the CD unit in the copier.
12. Insert the door switch actuator into the door switch and set the power switch ON.
13. Select the test/check service mode and press the "0" and "1" number keys.
14. Press the color select key.
    The copier will operate for three minutes. Do not pull out the door switch actuator nor switch the copier OFF.
    Note: If the power is switched OFF while the copier is operating, do the above procedure again, beginning with step 12.
15. Remove the door switch actuator and remove the CD unit from the copier gently, keeping it horizontal.
16. Attach the blocking plate to the CD unit.
17. Install the CD unit in the copier.
18. Turn the VR of the CD unit fully counter clockwise.
19. Insert a door switch actuator into the door switch and set the power switch ON.
20. Select the test/check service mode and press the "0" and "1" number keys.
21. Press the color select key again.
22. While the copier is operating, turn the VR of the CD unit clockwise until the LED begins flashing.
23. Continue turning the VR clockwise until the LED just begins glowing steadily.
    The correct position is as close as possible to the transition point from flashing to glowing steadily. Turning the VR much beyond this point may cause light images.

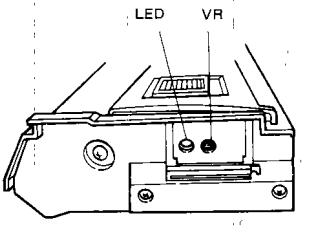

Figure 6-17

24. Set the power switch OFF, then ON again.
    (This releases the test/check service mode.)
    Note 1: Do steps 21. to 24. within thirty seconds.
    Note 2: The VR cannot be readjusted after switching out of service mode.
25. Remove the door switch actuator and gently remove the CD unit from the copier.
26. Raise the lid of the CD unit hopper.
27. Shake the toner cartridge end-to-end several times, keeping it level.
28. Put the toner cartridge on the CD unit with the seal facing down. Press the cartridge firmly onto the CD unit and peel off the seal.

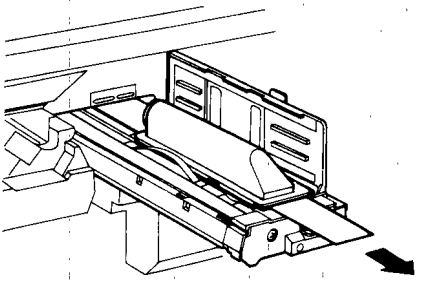

Figure 6-18

29. Remove the cartridge gently.
30. Shut the lid of the CD unit hopper gently.
31. Attach the color toner label and push the CD unit into the copier.
32. Shut the front door.

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VI. PROCEDURE FOR INSTALLING THE IMAGE EDITING UNIT

1. Unpacking and checking parts

Unpack the shipping carton and make sure it contains the parts shown in Figure 6-19 and 6-20.

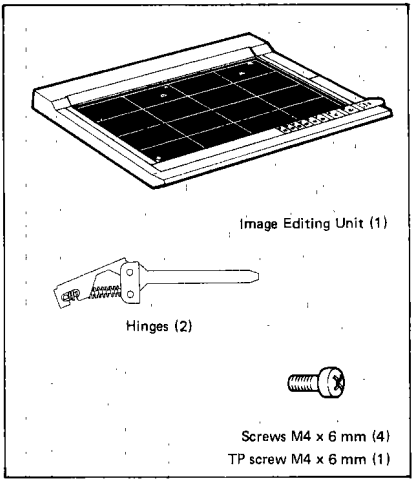

Figure 6-19 Image Editing Unit 1

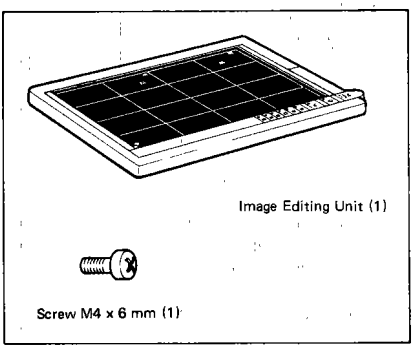

Figure 6-20 Image Editing Unit 2

2. Installation procedure

If using Image Editing Unit 1, attach the two hinges to it. (Each hinge has two screws)

Note: Rotate the sliding block of the hinges and attach it as shown in Figure 6-21.

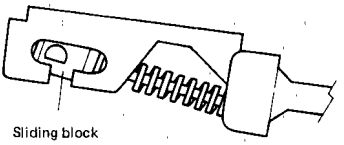

Figure 6-21

1) Pull out the power cord of the copier.
2) Remove the right and rear covers from the copier.
   If using Image Editing Unit 1, remove the copy-board cover and install Image Editing Unit 1 in its place.
3) Remove the blanking plate as shown in Figure 6-22. (1 screw)
4) Fix the grounding terminal of Image Editing Unit to the baseplate with the screw.

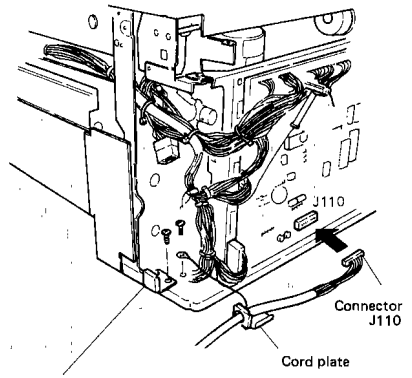

Figure 6-22

5) Attach the cord plate of Image Editing Unit in the place of the blanking plate.
6) Connect the connector of Image Editing Unit 1 to J110 on the DC controller PCB of the copier.

3. Service adjustment and initial settings

1) Install a door switch actuator, and set the power switch ON.
2) Input the initial settings of SPAN-X, ZERO-X, SPAN-Y and ZERO-Y, as described in the service adjustment sheet attached to the Image Editing Unit, using the service adjustment mode.

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4. Checking edit areas

1) Put an A3/Ledger size test sheet face-up on the Image Editing Unit so that it firmly contacts the left front corner.
2) Press the stylus against the test sheet at points 1 and 2 (as shown in Figure 6-23, and mark their locations on the test sheet for the following check of accuracy. This defines area 1. (Note that the pressure points are 10 mm in the X and Y directions away from (outside) the corner of the area to be designated.)
3) Press the stylus at points 3 and 4 shown in Figure 6-23 and mark their locations. This defines area 2.

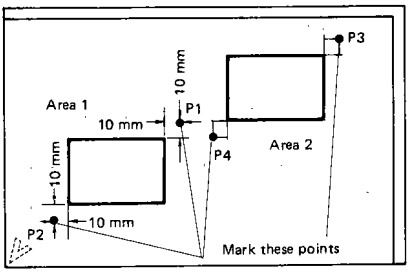

Figure 6-23

4) Press image shift mode No. 5 (BLACK) key with the stylus.
5) Put the test sheet on the copyboard in line with the index marks and press the COPY START key.
6) If the desired parts of areas 1 and 2 of the original (the area 10 mm inside the boundaries set by P1-P2 and P3-P4) are reproduced on the copy, the editing accuracy is within tolerances. If part of the desired parts of the original are not reproduced on the copy, make the required adjustment(s) described in section V, "Adjusting image area", then complete the checks listed below.
7) Check that the image shift mode key, registration key and C key of the Image Editing Unit function correctly.
8) When the Image Editing Unit is functioning correctly, write on the label attached to the inside of the front door the final inputted values of initial settings of SPAN-X, ZERO-X, SPAN-Y and ZERO-Y.
9) Attach the covers to the copier.

5. Adjusting image area

If the desired parts of an original are not reproduced correctly due to a lateral shift of the image, or if the copy images are larger or smaller than those on the original, do the following.

1) Press the stylus directly against the Image Editing Unit at the four points of the grid on the unit.
2) Put a test sheet on the copier copyboard.
3) Press the shift mode No. 5 (BLACK) key with the stylus, press the DIRECT key, select A3/Ledger copy paper size, and press the COPY START key.
4) Place the copy on the Editing Unit, with its lower left corner in firm contact with the lower left corner of the Editing Unit.
5) Measure the distance by which the copy image is offset from the grid position (the grid should be discernible through the paper.), and/or determine if the copy image is larger or smaller than the original.
6) Use the correction methods described on the following pages to correct the error.

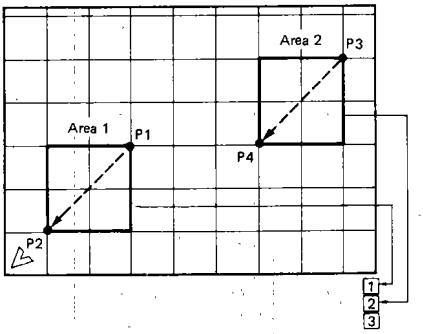

Figure 6-24

If the area designated using the Image Editing Unit and the area on the copy are not the same, adjust the Editing Unit as described below.

Images area on copy is offset in X direction. (side-to-side)

1) Select Service Adjustment mode 13.
2) Input the ZERO-X value with the [V] or [Λ] key.
   1) To move the image to the right, decrease the ZERO-X value.
   2) To move the image to the left, increase the ZERO-X value.

   Increasing or decreasing the ZERO-X value by "1" moves the image area on the copy paper about 1.8 mm horizontally.
3) Push the [*] key, then the [R] key.
4) Make a sample copy as before and check the image area.

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Image area on copy is offset in Y direction. (up-and-down)

1) Select Service Adjustment mode 15.
2) Input the ZERO-Y value with the [V] or [Λ] key.
   1) To move the image up, decrease the ZERO-Y value.
   2) To move the image down, increase ZERO-Y value.

   Increasing or decreasing the ZERO-Y value by "1" moves the image area on the copy paper about 1.3 mm vertically.
3) Push the [*] key, then the [R] key.
4) Make a sample copy as before and check the image area.

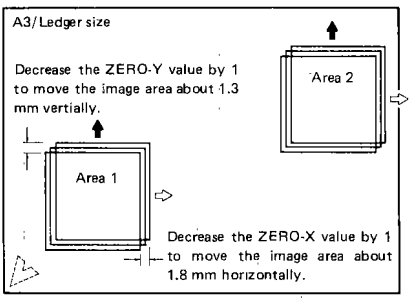
A3/Ledger size
Decrease the ZERO-Y value by 1 to move the image area about 1.3 mm vertially.
Area 2
Area 1
Decrease the ZERO-X value by 1 to move the image area about 1.8 mm horizontally.
Direction of move by decreasing ZERO-X value.
Direction of move by decrreasing ZERO-Y value.

Figure 6-25

The image area on the copy is expanded or shrunk side-to-side (X direction).

1) Select Service Adjustment mode 12.
2) Input the SPAN-X value with the [V] or [Λ] key.
   1) To expand the image, decrease the SPAN-X value.
   2) To shrink the image, increase the SPAN-X value.

   The farther a defined area is from the origin (lower left corner), the greater the effect of changing the SPAN-X value.
3) Push the [*] key, then the [R] key.
4) Make a sample copy as before and check the image area.

The image area on the copy is expanded or shrunk side-to-side (Y direction).

1) Select Service Adjustment mode 14.
2) Input the SPAN-Y value with the [V] or [Λ] key.
   1) To expand the image, decrease the SPAN-Y value.
   2) To shink the image, increase the SPAN-Y value.

   The farther a defined area is from the origin (lower left comer), the greater the effect of
3) Push the [*] key, then the [R] key.
4) Make a sample copy as before and check the image area.

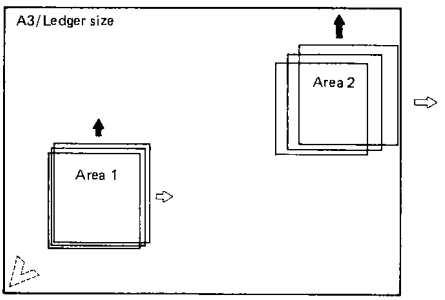
A3/Ledger size
Area 2
Area 1
Direction that the defined area moves if the SPAN-X value is decreased.
Direction that the defined area moves if the SAPN-Y value is decreased.

Figure 6-26

I. PARTS TO BE REPLACED PERIODICALLY

To maintain the copier at its peak performance, the parts listed in the following chart must be periodically replaced. Although the deterioration of a part may not be visible, it can seriously hamper the performance of the copier if not replaced on schedule.

Parts should be replaced during the regular service visit that is close to the end of the service life of the part.

End of April 1988

No.	Description	Part No.	Q'ty	Service life (Number of copies)	Remarks
1	Corona wires	FY3-0040-000	AR	30,000	
2	Ozone filter	FG9-1677-000	AR	50,000	or 1 year
3	Side scraper (Black developing ass'y)	FA3-8586-000	2	200,000	
4	Side seal (Black developing ass'y)		2	200,000	
5	Front spacer roller (Black developing ass'y)	FS1-6186-000	1	200,000	
6	Rear spacer roller (Black developing ass'y)	FS1-6187-000	1	200,000	

Note: The above values are estimates and are subject to change. AR: As required

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II. EXPECTED SERVICE LIVES OF PARTS AND CONSUMABLES

End of April 1988.

No.	Description	Part No.	Q'ty	Service life (Number of copies)	Remarks
1	Roller, Pick-up A (NP-3725/3525)	FF9-0581-000	4	100,000	
2	Roller, Pick-up B and C (NP-3725/3525)	FA3-8733-000	8	100,000	
3	Roller, Pick-up (NP-3225/3025)	FF1-4170-000	6	100,000	Upper cassette
4	Roller, Pick-up (NP-3225/3025)	FA3-2615-000	6	100,000	Lower cassette
5	Lamp, Scanning	FH7-3066-000	1	100,000	100/115V
		FH7-3067-000	1	100,000	220/240V
6	Roller, Lower (Fixing assembly)	FA3-8867-000	1	100,000	
7	Belt, Cleaning (Fixing assembly)	FA3-8908-000	1	100,000	
8	Drum separation claw	FA3-8577-000	4	100,000	
9	Roller, Upper (Fixing assembly)	FA3-8866-000	1	200,000	
10	Pre-exposure lamp	FH7-3069-000	1	200,000	
11	Upper separation claw (Fixing assembly)	FA9-0451-000	4	200,000	
12	Lower separation claw (Fixing assembly)	FA2-9037-000	4	200,000	
13	20T gear (Black developing assembly)	FS2-0460-000	1	300,000	
14	Lower registration roller	FF9-0671-000	1	300,000	
15	Blank exp. LED ass'y	FG1-4720-000	1	300,000	NP-3725/3525
16	Blank exp. LED ass'y	FG1-4696-000	1	300,000	NP-3225/3025
17	Blank exp. lamp ass'y	FG1-4697-000	1	300,000	NP-3225/3025
18	Developing cylinder (Black developing assembly)	FA3-8583-000	1	300,000	
19	Scanner drive cable	FA3-9096-000	1	500,000	
20	CD unit (red)	F61-1401-700	1	60,000	Note 1
	CD unit (blue)	F61-1401-702	1	60,000	
	CD unit (brown)	F61-1401-704	1	60,000	
	CD unit (green)	F61-1401-706	1	60,000	
21	Delivery feed roller (Duplexing unit)	FA3-8296-000	1	100,000	Note 2
22	Pick-up roller (Duplexing unit)	FA3-8279-000	1	100,000	
23	Feed/separation roller (Duplexing unit)	FA3-8733-000	2	100,000	

Note: 1. The above values are estimates and are subject to change.

2. The figures in the Service Life column mean the number of copies made with the CD unit and are not the number indicated on the total counter.
3. The figures in the Service Life column mean the number of copies made withe the duplexing unit and are not the number indicated on the total counter.

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III. BASIC PROCEDURES FOR PERIODIC SERVICING

1. As a rule, periodic servicing should be performed every 10,000 copies.
2. Before making a visit, check the customer's file and pack any replacement parts that may be required.

No.	Procedure	Check	Remarks
1	Speak with the person in charge.	Check the condition of the machine.	
2	Record the counter reading.	Check the number of mis-copies.	
3	Make test copies. (Direct, reduction, enlargement, two-page separation, two-sided copies, image overlay)	Check for: a. Copy density b. Dirty background c. Sharpness of lines d. Leading-edge blank area e. Left and right blank strips f. Fixing, registration, marks on backs of copies. g. Unusual noises h. Operation of counters	Standard: 2.5 ± 1mm (DIRECT copying) Standard: 2.0 ± 1.0 mm (DIRECT copying)
4	Clean the corona assemblies.		Wipe with dry lint-free paper, then clean with alcohol.
5	Clean the transfer guides.		Remove the drum unit.
6	Clean the separation and transfer assemblies. · Separation claws · Feeder belt · Holding tray paper feed guide		Install the drum unit.
7	Clean the fixing and delivery areas. · Inlet guide · Separation claws (upper and lower) · Inspect the cleaning belt		Use MEK.
8	Perform periodic servicing appropriate to the number copies made. (See page 7-3.)		
9	Clean the copyboard cover and the copyboard glass.		
10	Make a test copy.		
11	Make a sample copy.		
12	Check the test and sample copies, and clean up the area around the copier.		
13	Record the number shown on the counter.		
14	Enter all relevent information on the service sheet. Inform the person in charge that servicing is complete.		

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IV. PERIODIC SERVICING SCHEDULE

Note: Do not use solvents or oils other than those specified.

△: Clean ○: Replace ×: Lubricate □: Adjust ◎: Check

Unit	Description	Periodic Servicing					Remarks
		Every 10,000 copies	Every 30,000 copies	Every 60,000 copies	Every 120,000 copies	Every 240,000 copies	
Externals	Copyboard glass	△					Clean with alcohol
	Ozone filter			○			Or after one year
Optical drive	Scanner rail		×		×	×	Clean with alcohol, and lubricate with low-viscosity lubricating oil.
Pick-up unit	Clutch spring		×		×	×	Lubricate with low-viscosity lubricating oil.
	Pick-up rollers				◎○		
Separation/ feeder unit	Drum separation claw				○		
	Transfer guides (upper and lower)	△					Use a moist cloth.
	Transfer/separation corona ass'y guide rail	△					Use a moist cloth.
	Feeder belt/paper feed guide	△					Use a moist cloth.
	Clutch spring		×				Clean with low-viscosity lubricating oil.
Optical	Scanning lamp reflector		△				Use a blower brush.
	Scanning lamp side reflector		△				Use a blower brush.
	Mirrors 1-6		△				Use a blower brush. If not sufficient, clean with alcohol.
	Dust-proofing glass	△					
	Lens		△				Use a blower brush.
	Pre-exposure lamp					○	
	Blank-exposure lamp	△					Use a moist cloth.
Coronas	Primary corona/grid wire	△	△○				Wipe off with dry lint-free paper, then clean with alcohol.
	Pre-transfer corona wire	△	△○				
	Transfer/separation corona wire	△	△○				
Black developing unit	Spacer roller		△				Clean with alcohol
	Scraper					○	
	Side seal					○	
Fixing	Inlet guide	△					Clean with MEK.
	Gears		×				Apply high-temperature grease.
	Cleaning belt				◎○		
	Upper roller	△				◎○	
	Lower roller	△			◎○		Clean with alcohol.
Copy delivery unit	Separation claws	△					Clean with MEK.

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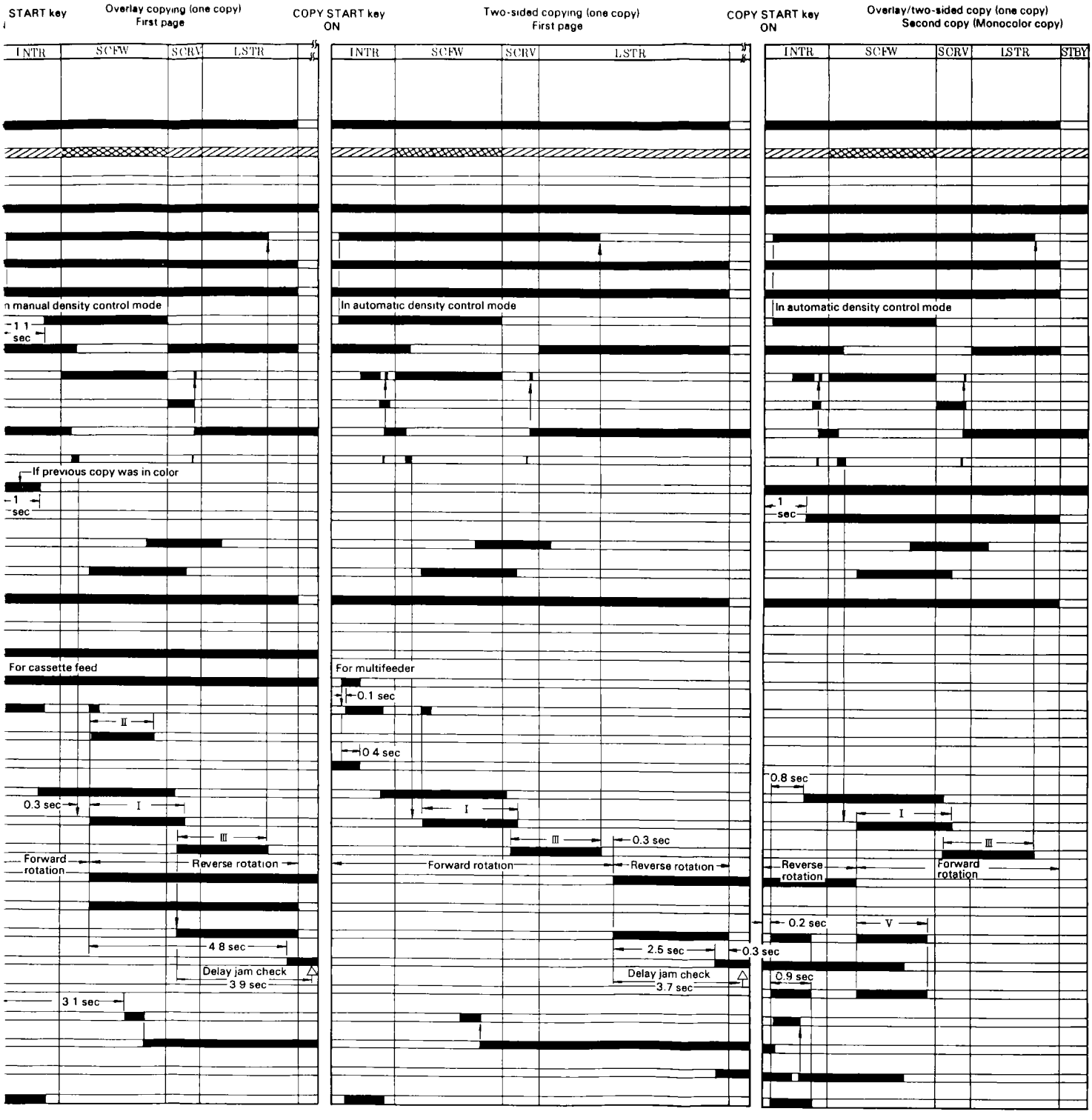
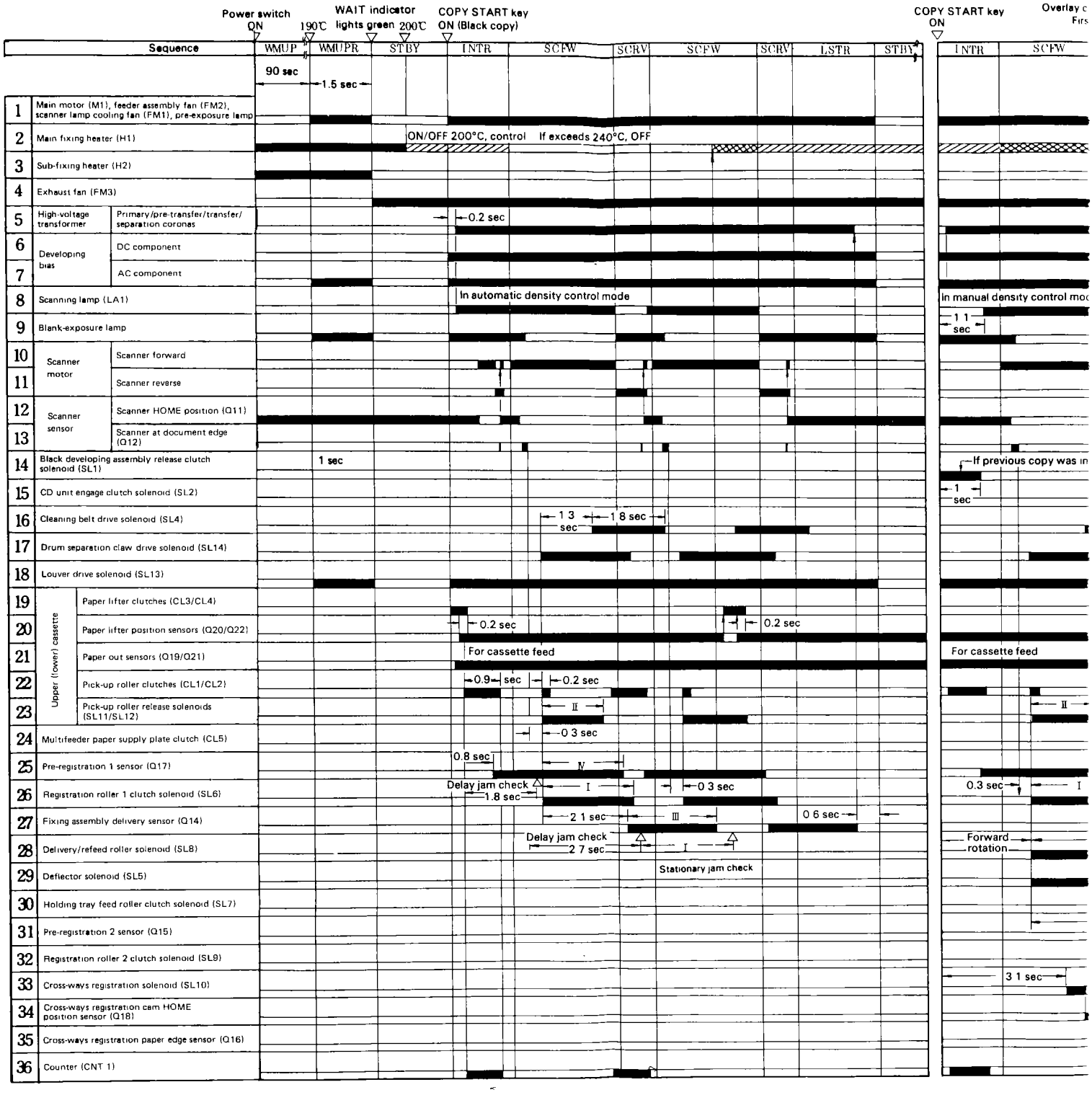


Legal	Letter	Letter R	Multifeeder
2.21	1.39	1.76	2.66
1.51	0.68	1.05	1.95
2.09	1.27	1.64	2.54
1.95	1.13	1.50	2 40
1.66	0.84	1.21	2.11

(Unit. sec)

■ NP-3725/3525



Cassette	A 3	A 4	B 4	B 5	UL	US	A 4 R	B 5 R	Ledger	Legal	Letter
I	2.59	1.35	2.26	1.19	2.29	1.47	1.86	1.63	2.66	2.21	1.39
II	1.88	0.65	1.55	0.48	1.59	0.76	1.16	0.92	1.95	1.51	0.68
III	2.47	1.24	2.14	1.07	2.18	1.35	1.75	1.51	2.54	2.09	1.27
IV	2.33	1.09	2.00	0.93	2.04	1.21	1.61	1 37	2.40	1.95	1.13
V	2.04	0.81	1.71	0 64	1.75	0.92	1.32	1.08	2.11	1.66	0.84

(Unit sec)

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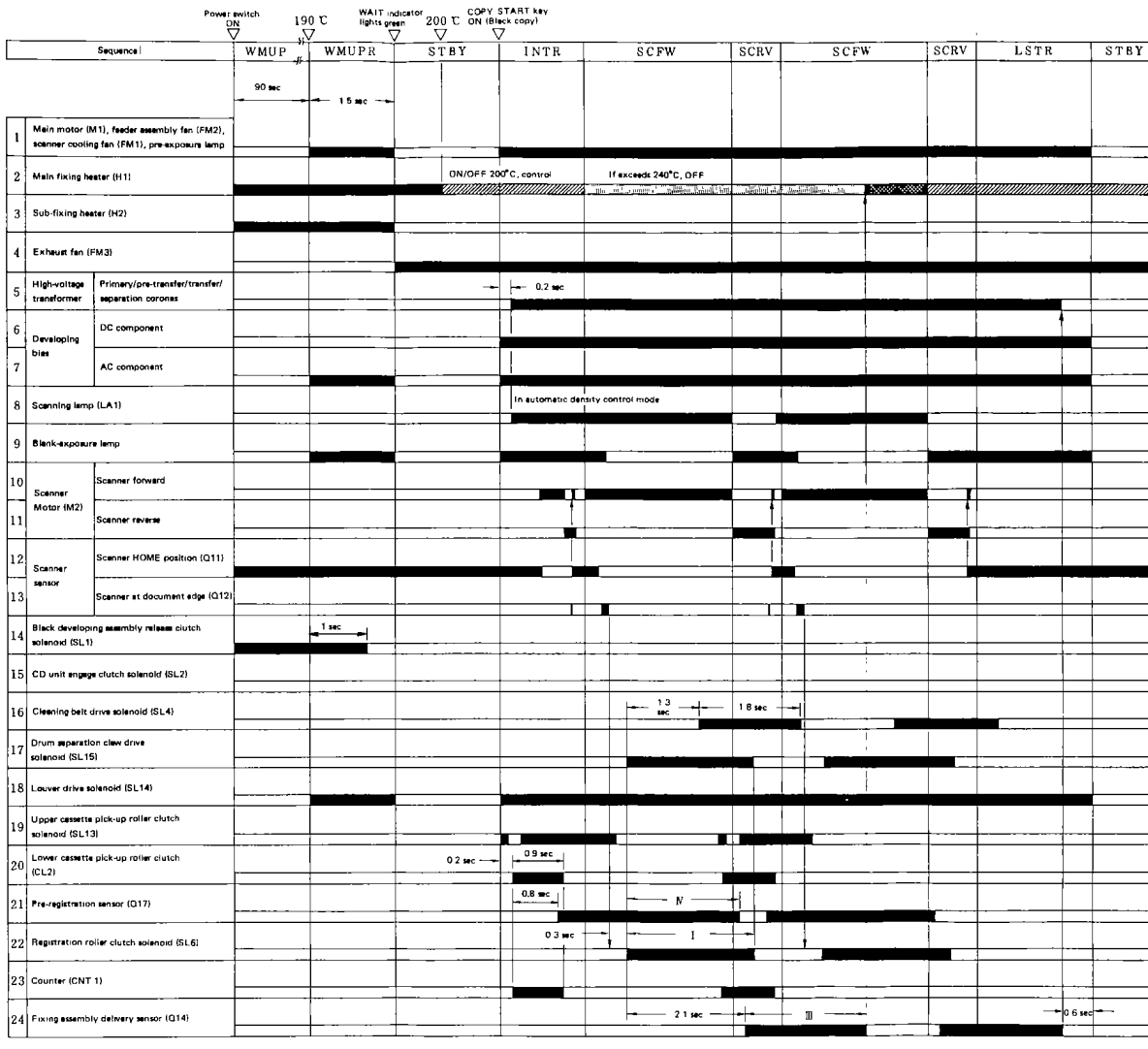

Cassette	A3/ Ledger	A4/ Letter	B4/ Legal	B5/U2/ Mini R	U1	U3	A4R/ Letter R	B5R	Manual feed
I	2.66	1.39	2.26	1.39	2.24	1.41	1.86	1.63	2.66
II	2.54	1.27	2.14	1.27	2.12	1.29	1.75	1.51	2.54
IV	2.40	1.13	2.00	1.13	1.98	1.15	1.61	1.37	2.40

(Unit sec)

2. LIST OF SIGNALS/COMMANDS

BDRSD	BLACK DEVELOPING ASSEMBLY RELEASE CLUTCH SOLENOID DRIVE command
BTEP	BLACK TONER OUT signal
CBCC	COPYBOARD COVER CLOSED signal
CCNTD	CONTROL COUNTER DRIVE command
CCNTDT	CONTROL COUNTER DETECT signal
CDPSD	CD UNIT ENGAGE CLUTCH SOLENOID DRIVE command
CLBSD	CLEANING BELT DRIVE SOLENOID DRIVE command
CRGSD	CROSS-WAYS REGISTRATION CLUTCH SOLENOID DRIVE command
CTEP	COLOR TONER OUT signal
CTSSD	COLOR TONER SUPPLY SOLENOID DRIVE command
DACF	DF ACKNOWLEDGE signal
DFSD	HOLDING TRAY FEED ROLLER CLUTCH SOLENOID DRIVE command
DNC	DF NOT CONNECTED signal
DPSD	DEFLECTOR SOLENOID DRIVE command
DREQ	DF REQUEST signal
DRMD	DRUM (MAIN MOTOR) DRIVE command
DSIN	DF SERIAL INPUT signal
DSOUT	DF SERIAL OUTPUT signal
DSSD	DRUM SEPARATION CLAW SOLENOID DRIVE command
EFMD	EXHAUST FAN MOTOR DRIVE command
FFMD	FEEDER ASSEMBLY FAN MOTOR DRIVE command
GAIN	SCANNER MOTOR SPEED CONTROL CIRCUIT OUTPUT SWITCHING command
HMD	HOPPER MOTOR DRIVE command
HVAC	AC TRANSFORMER DRIVE command
HVBAC	AC DEVELOPING BIAS DRIVE command
HVBDC	DC DEVELOPING BIAS CONTROL command
HVPR	PRIMARY CORONA CURRENT CONTROL command
HVPT	PRE-TRANSFER CORONA CURRENT CONTROL command
HVSP	SEPARATION CORONA CURRENT CONTROL command
HVTR	TRANSFER CORONA CURRENT CONTROL command
IFMD	SCANNER COOLING FAN MOTOR DRIVE command
JRST	JAM RESET signal
LAON	SCANNING LAMP ON signal
LCAST	LOWER CASSETTE SIZE DETECTION SWITCH READ signal
LHP	LENS HOME POSITION signal
LINT	LIGHT INTENSITY command
LLFTP	LOWER CASSETTE PAPER LIFTER POSITION signal
LLTCD	LOWER CASSETTE PAPER LIFTER CLUTCH DRIVE command
LMDP1	LENS MOTOR DRIVE PULSE 1
LMDP2	LENS MOTOR
LPEP	LOWER CASS
LPRSD	LOWER CASS command
LPUCD	LOWER CASS
LRD	LAMP REGULA
LVSD	LOUVER DRIVE
MFLCD	MULTIFEEDE DRIVE comm.
MFS	MULTIFEEDE
MHTRD	MAIN HEATER
MMCLK	MAIN MOTOR
OLEDD	DOCUMENT SI
OSZ1	DOCUMENT SI
OSZ2	DOCUMENT SI
OSZ3	DOCUMENT SI
PDP	FIXING ASSEI
PDP1	PRE-REGISTR
PDP2	FIXING ASSEI
PDP3	PRE-REGISTR
PDP4	CROSS-WAYS DETECTION s
PEXP	PRE-CONDITIO
RGHP	CROSS-WAYS
RGSD	REGISTRATION
RGSD1	REGISTRATION
RGSD2	REGISTRATION
RVSD	DELIVERY/REFI
SACK	SORTER ACKN
SCBP	SCANNER REV
SCCLK	SCANNER MO
SCDP	SCANNER AT D
SCHP	SCANNER HOM
SCFW	SCANNER FOR
SCMC	SCANNER MO
SCRV	SCANNER REVI
SHTRD	SUB HEATER D
SNC	SORTER NOT
SREQ	SORTER REQU
SSIN	SORTER SERIA
SSOUT	SORTER SERIA
TCNTD	TOTAL COUNT
TH1	FIXING ROLLER
UCAST	UPPER CASSE

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; MOTOR DRIVE PULSE 2

'ER CASSETTE PAPER OUT signal

/ER CASSETTE PICK-UP ROLLER RELEASE SOLENOID DRIVE
nand

'ER CASSETTE PICK-UP ROLLER CLUTCH DRIVE command

P REGULATOR DRIVE command

VER DRIVE SOLENOID DRIVE command

.TIFEEDER PAPER SUPPLY PLATE CLUTCH
'E command

.TIFEEDER (MANUAL FEED) SENSOR signal

N HEATER DRIVE command

N MOTOR CLOCK signal

UMENT SIZE DETECTION LED DRIVE command

UMENT SIZE DETECTION signal 1

UMENT SIZE DETECTION signal 2

UMENT SIZE DETECTION signal 3

NG ASSEMBLY DELIVERY SENSOR signal

-REGISTRATION SENSOR signal 1

NG ASSEMBLY DELIVERY SENSOR signal

-REGISTRATION SENSOR signal 2

SS-WAYS REGISTRATION PAPER EDGE
ECTION signal

CONDITIONING EXPOSURE LAMP LIGHTING command

SS-WAYS REGISTRATION CAM HOME POSITION SENSOR signal

STRATION ROLLER CLUTCH SOLENOID DRIVE command

STRATION ROLLER 1 CLUTCH SOLENOID DRIVE command

STRATION ROLLER 2 CLUTCH SOLENOID DRIVE command

VERY/REFEED ROLLER SOLENOID DRIVE command

TER ACKNOWLEDGE signal

NNER REVERSE POSITION signal

NNER MOTOR CLOCK signal

NNER AT DOCUMENT EDGE POSITION signal

NNER HOME POSITION signal

NNER FORWARD DRIVE command

NNER MOTOR SPEED CONTROL command

NNER REVERSE DRIVE command

HEATER DRIVE command

TER NOT CONNECTED signal

TER REQUEST signal

TER SERIAL INPUT signal

TER SERIAL OUTPUT signal

AL COUNTER DRIVE command

IG ROLLER SURFACE TEMPERATURE signal

ER CASSETTE SIZE DETECTION SWITCH READ signal

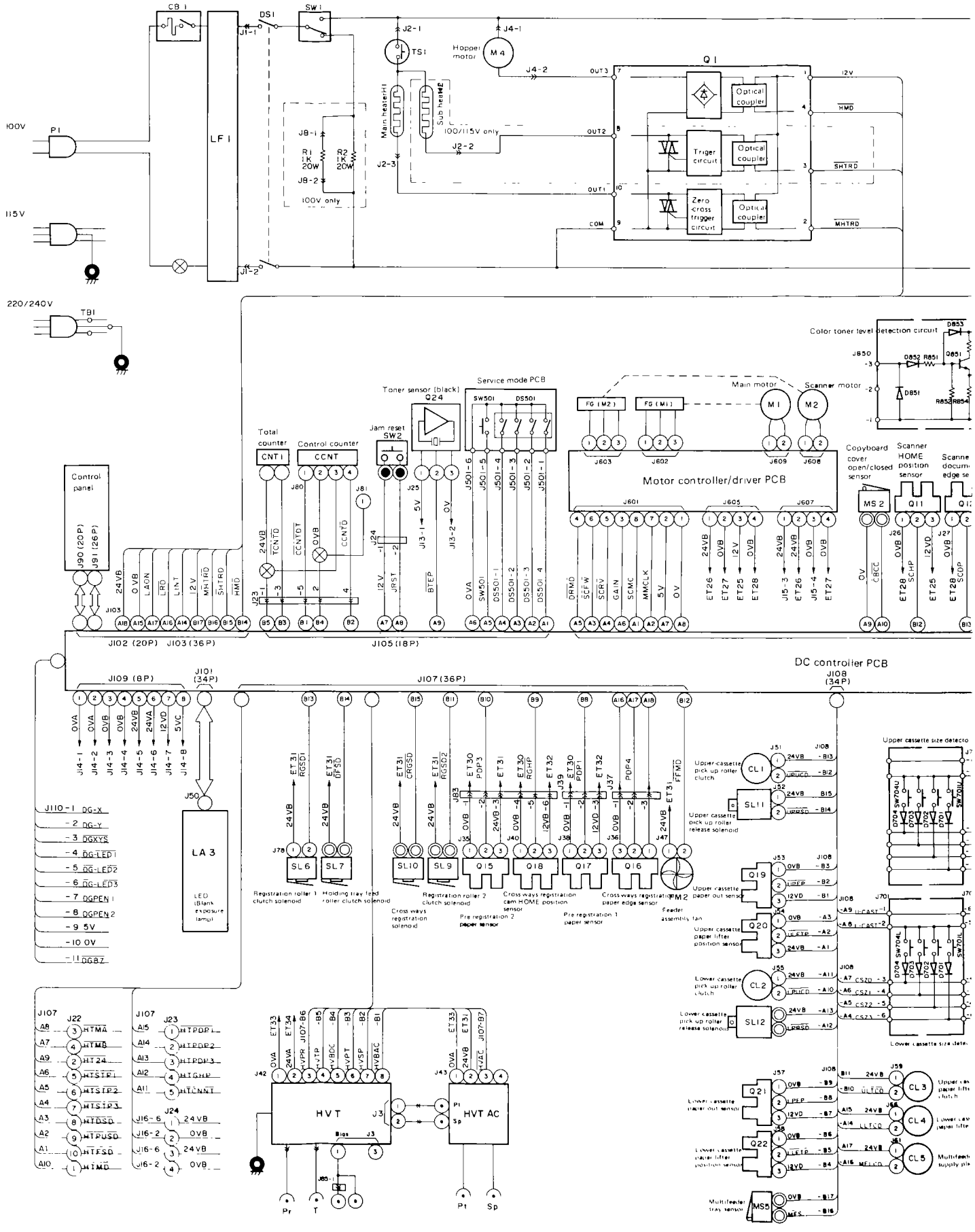
ULFTP	UPPER CASSETTE PAPER LIFTER POSITION signal
ULTCD	UPPER CASSETTE PAPER LIFTER CLUTCH DRIVE command
UPEP	UPPER CASSETTE PAPER OUT signal
UPRSD	UPPER CASSETTE PICK-UP ROLLER RELEASE SOLENOID DRIVE command
UPUCD	UPPER CASSETTE PICK-UP ROLLER CLUTCH DRIVE command
UPUSD	UPPER CASSETTE PICK-UP ROLLER CLUTCH SOLENOID DRIVE command

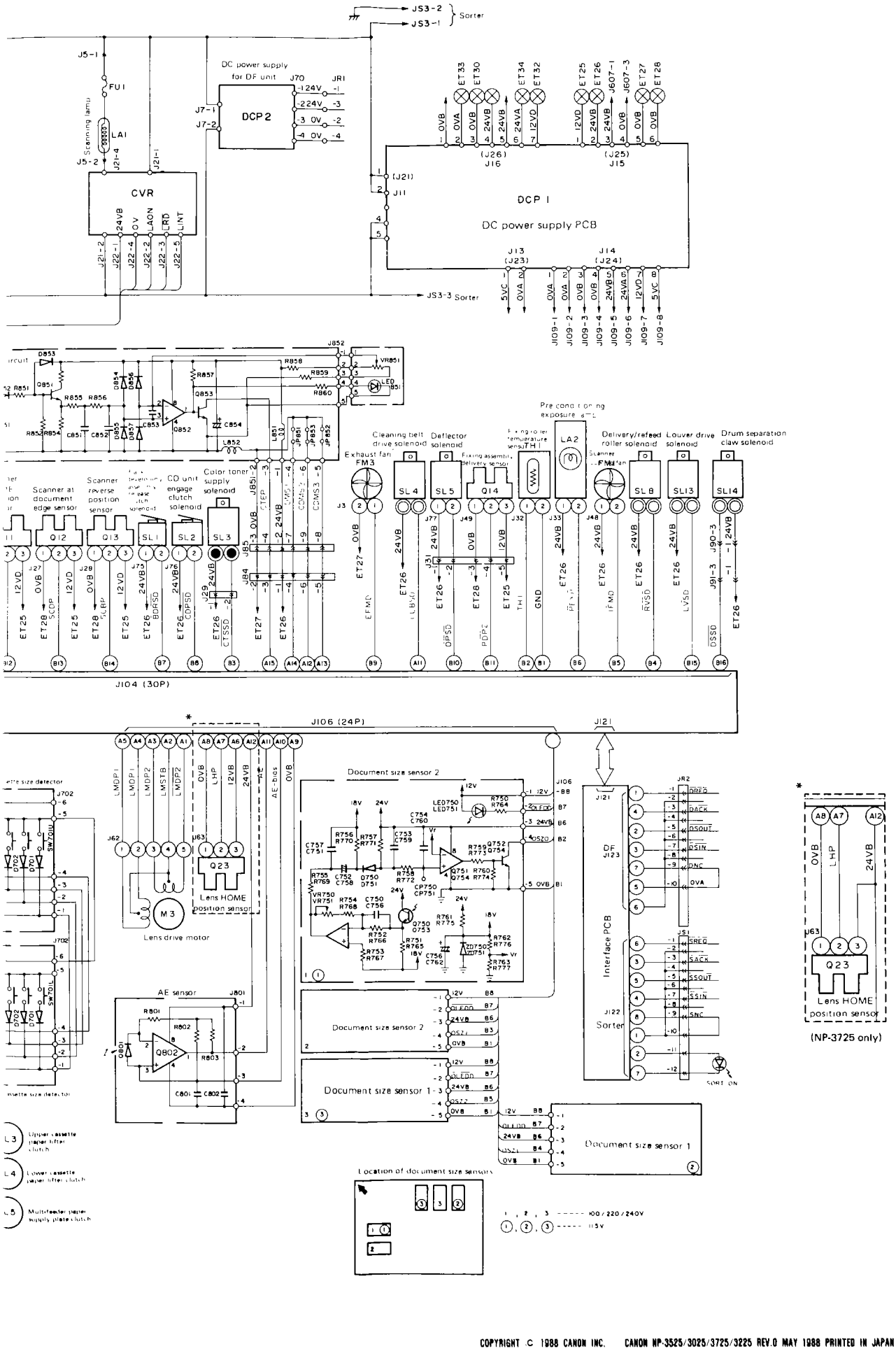
LIST OF ABBREVIATIONS

INTR	INITIAL ROTATION
LSTR	LAST ROTATION
SCFW	SCANNER FORWARD
SCRV	SCANNER REVERSE
STBY	STANDBY
WAIT	WAIT
WMUP	WARM UP
WMUPR	WARM UP ROTATION

3. GENERAL CIRCUIT DIAGRAM

■ NP-3725/3525





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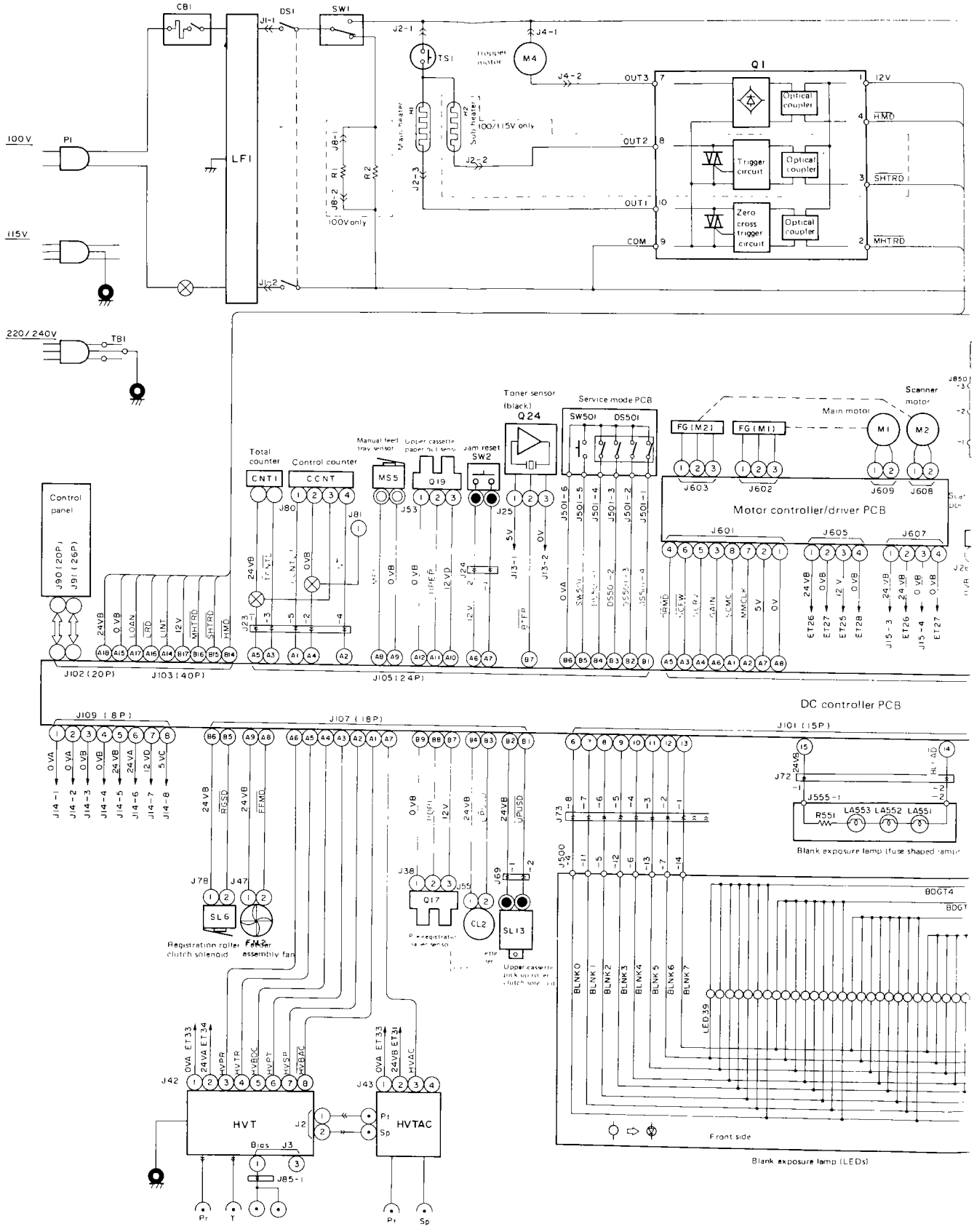
■ NP-3225/3025



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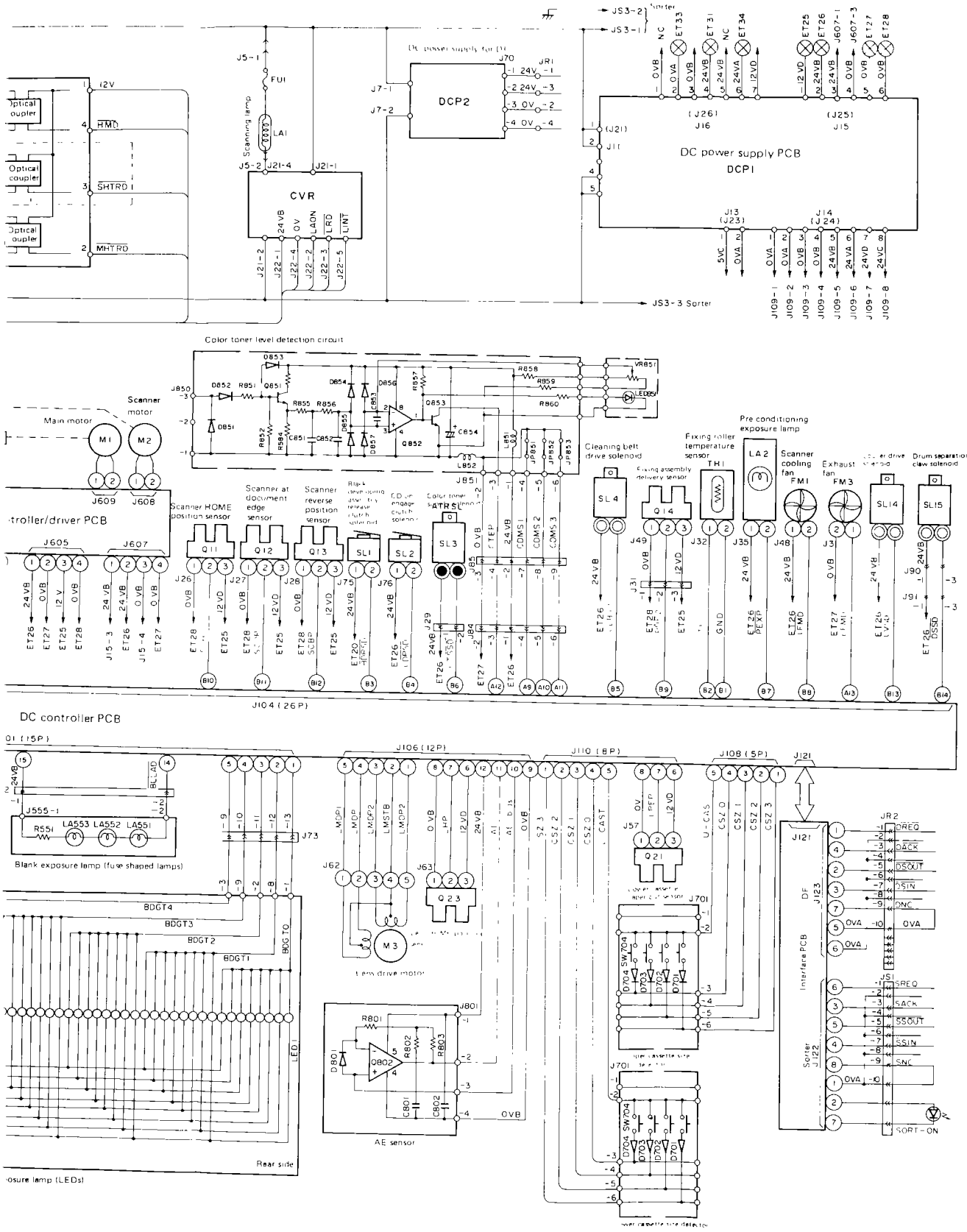
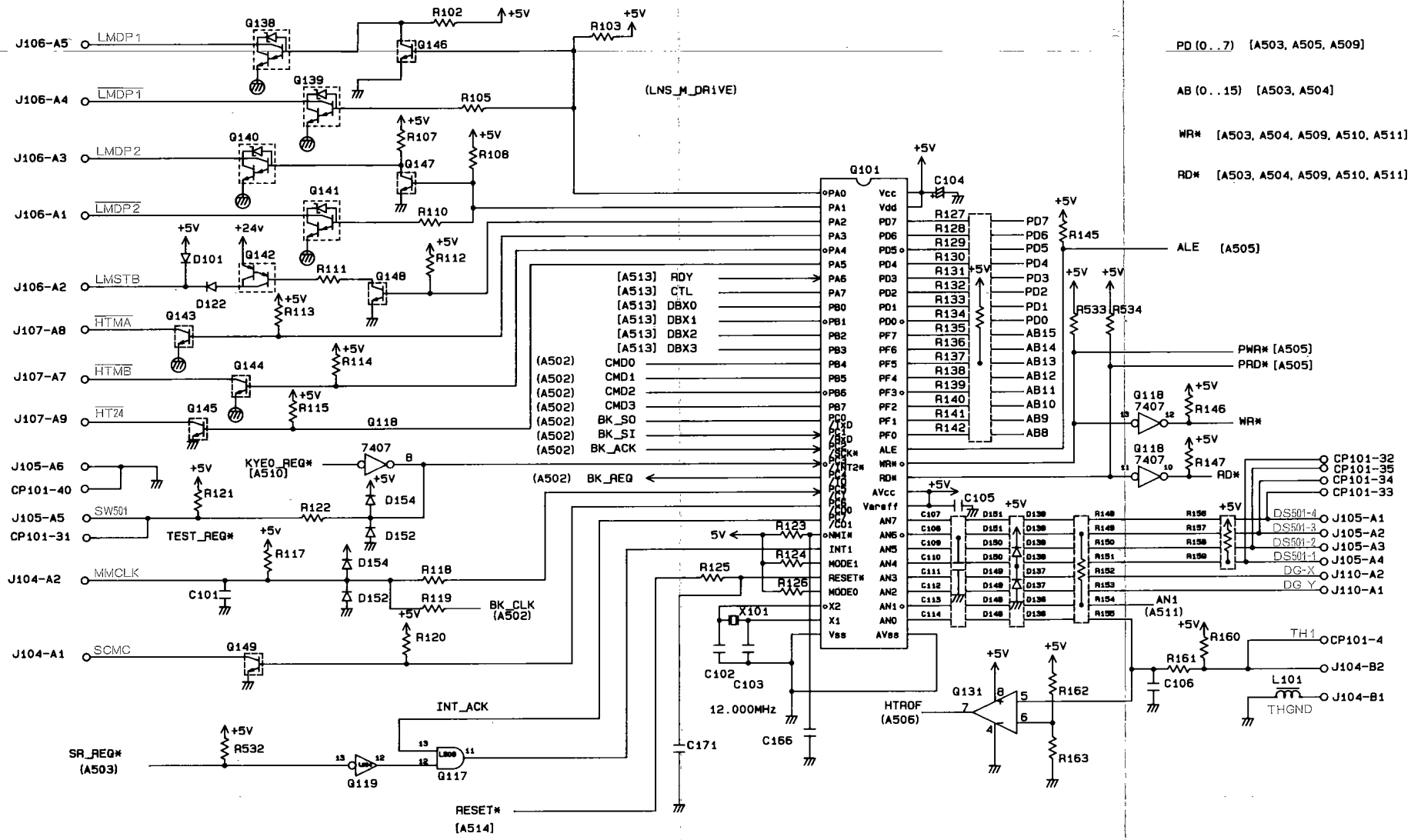

DC power supply PCB
DCP1
DCP2
CVR
Optical coupler
Optical coupler
Optical coupler
SHTRD1
MHTRD
Scanning lamp
FU1
LA1
Sorter
JS3-3 Sorter
Color toner level detection circuit
Main motor
Scanner motor
M1
M2
Scanner HOME position sensor
Scanner at document edge sensor
Scanner reverse position sensor
Cleaning belt drive solenoid
Fixing roller temperature sensor
Pre conditioning exposure lamp
Scanner cooling fan
Exhaust fan
Drum separation claw solenoid
DC controller PCB
J104 (26P)
Blank exposure lamp (fuse shaped lamps)
Lens drive motor
AE sensor
Rear side
Interface PCB
Sorter
SORT-ON



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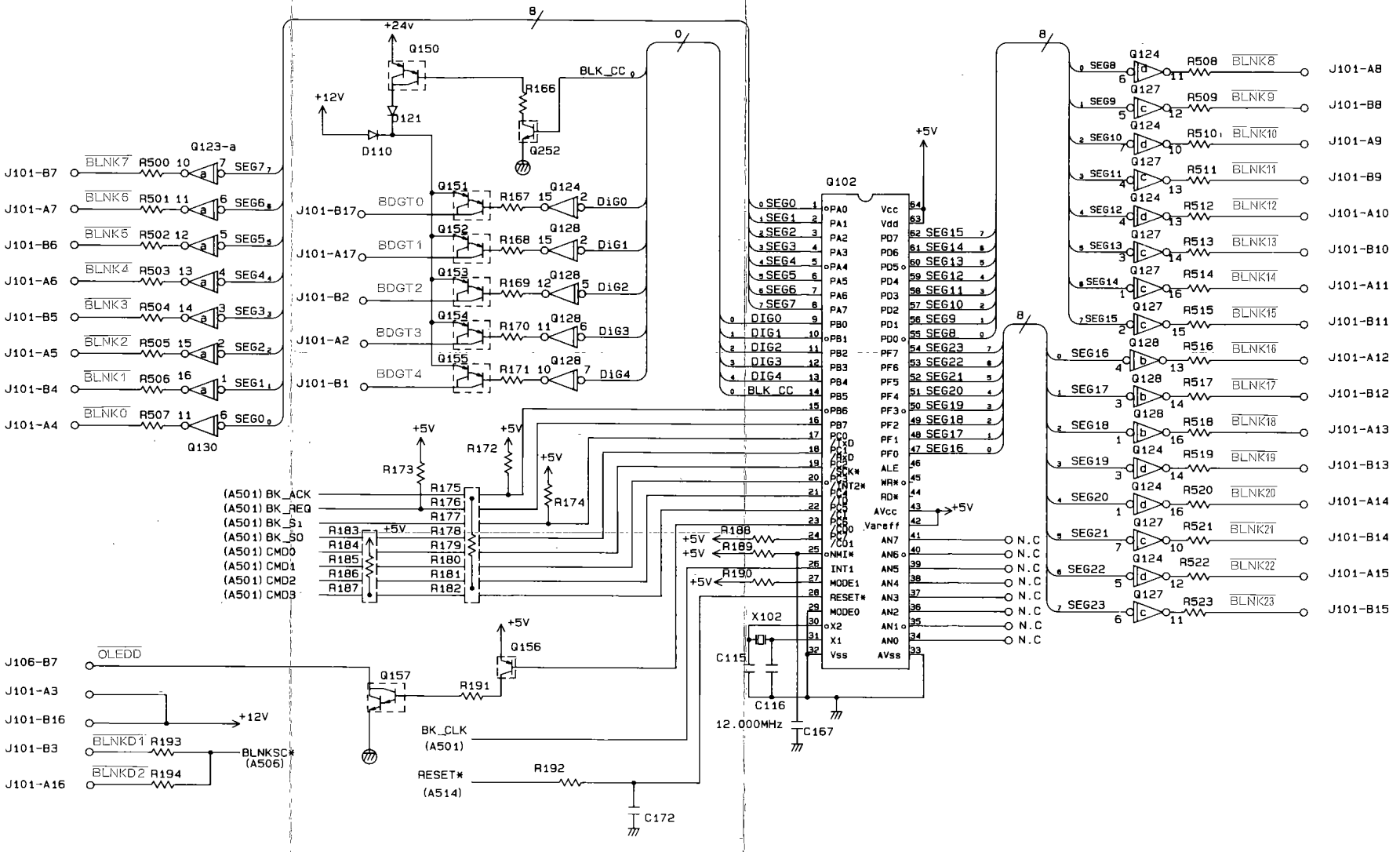

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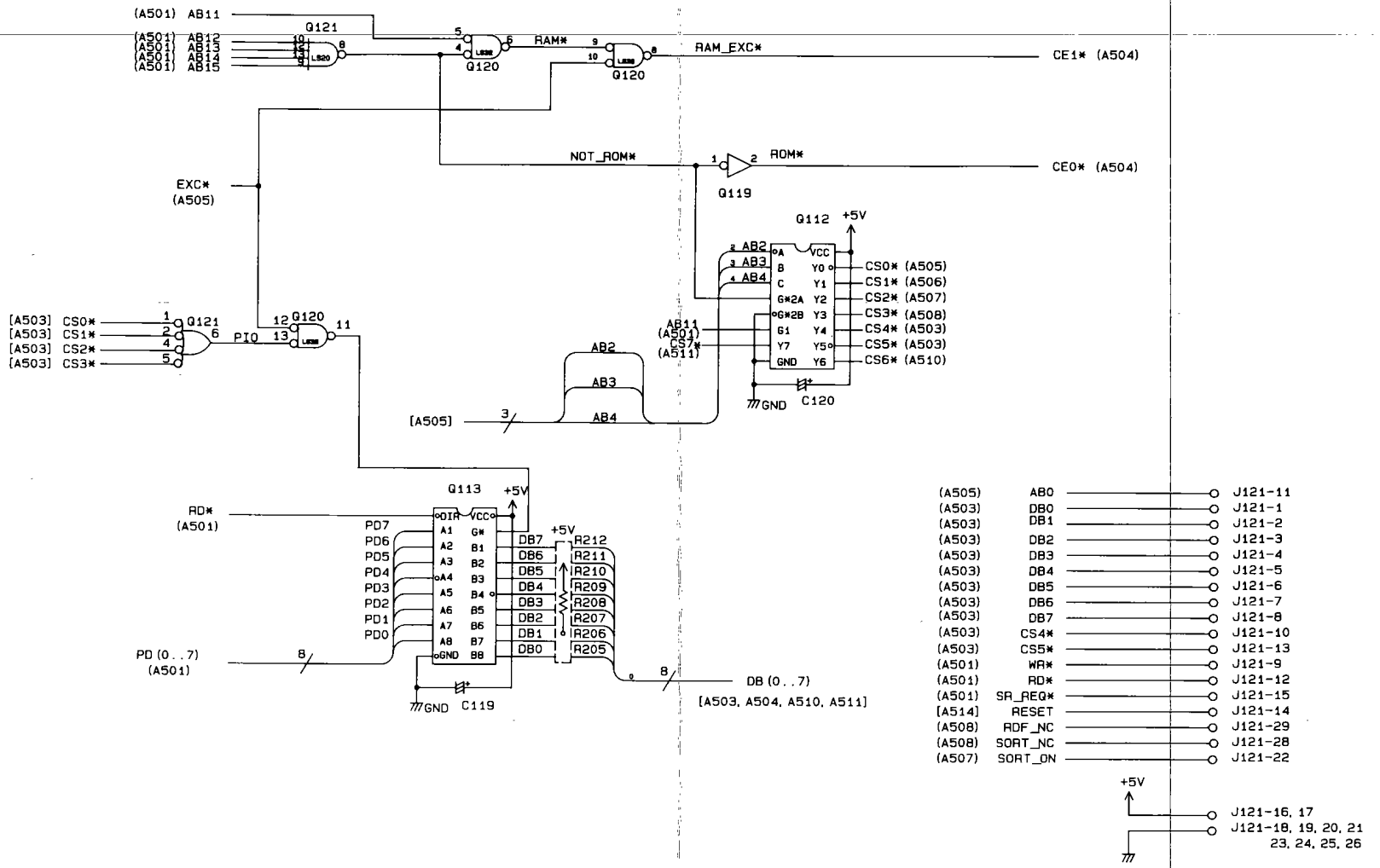

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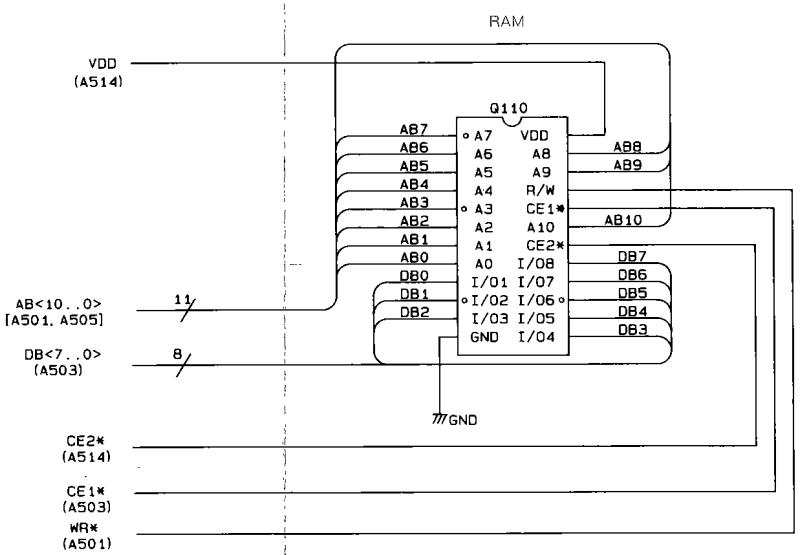

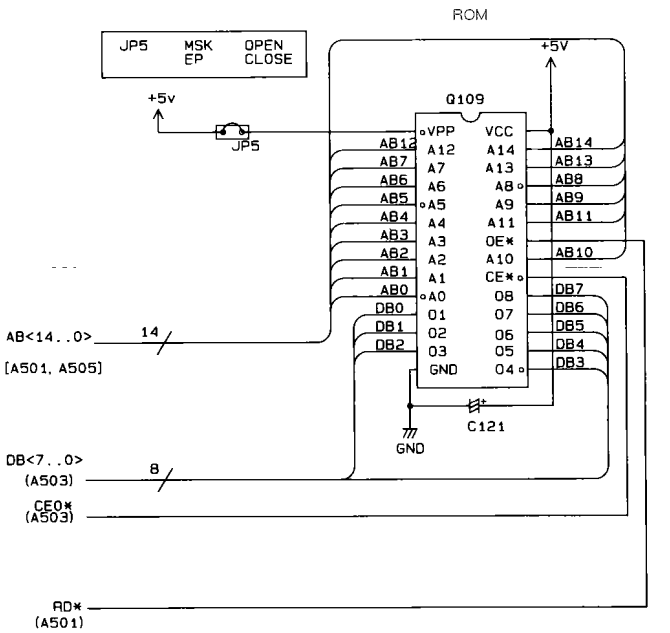

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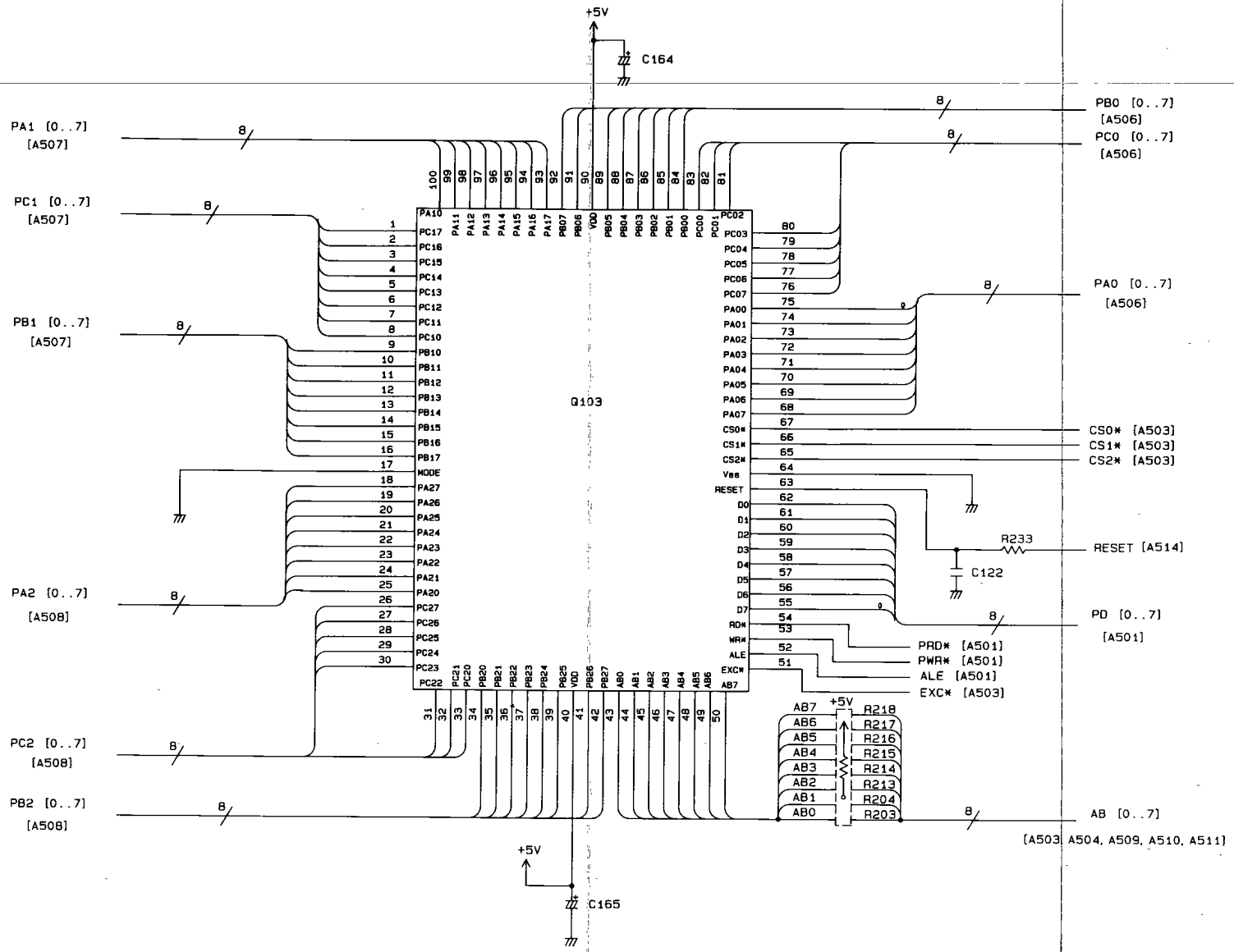

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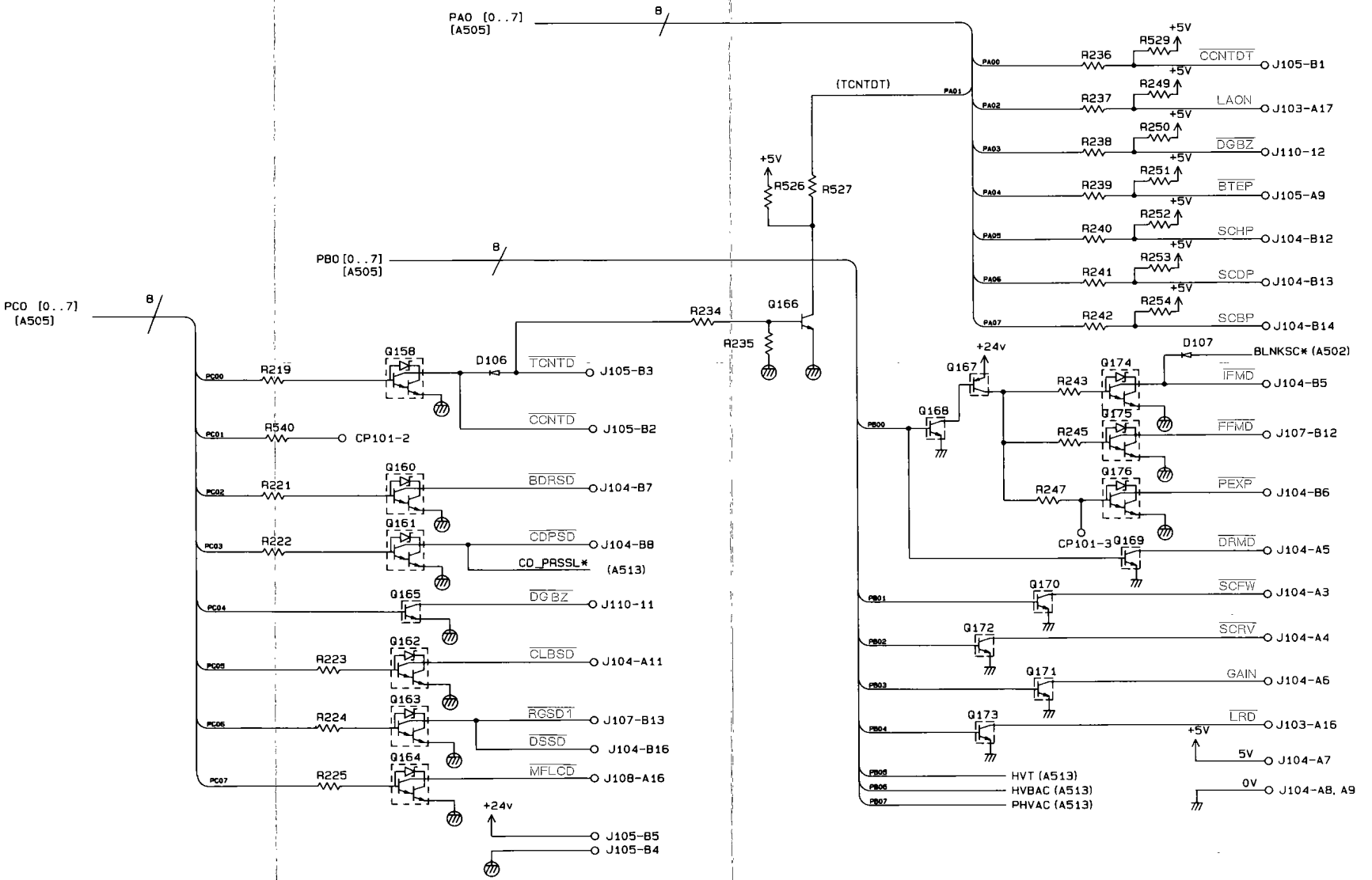

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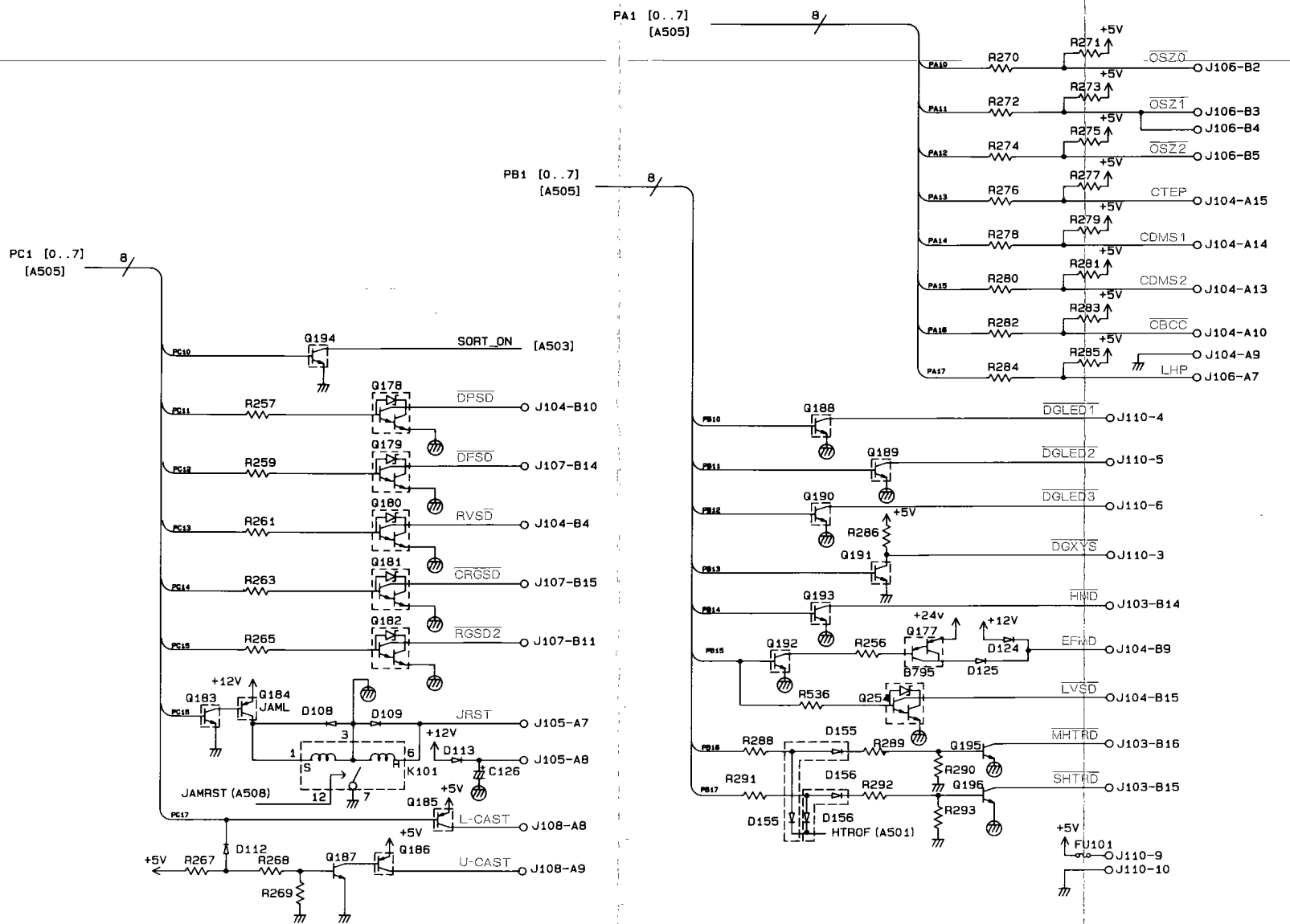

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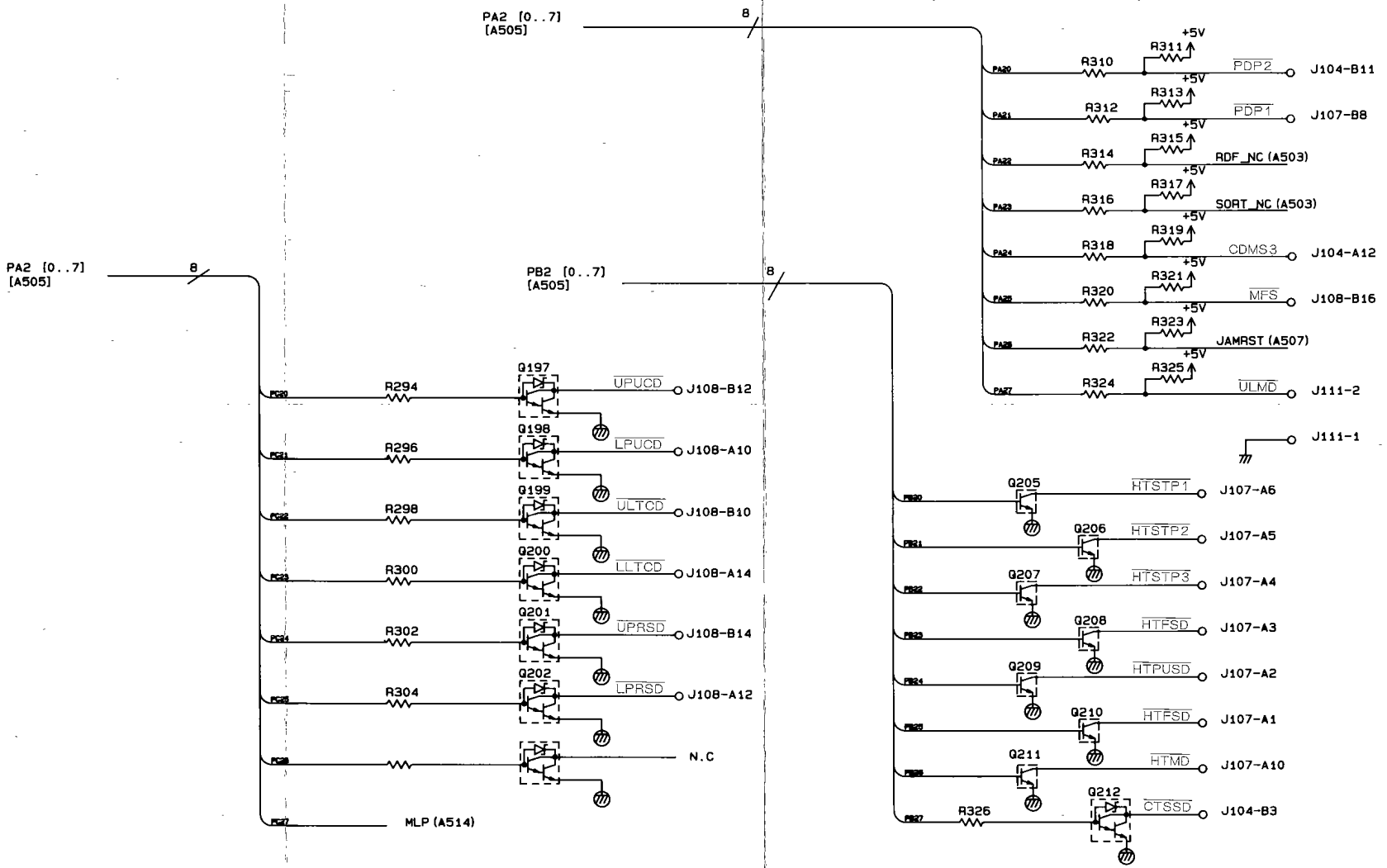

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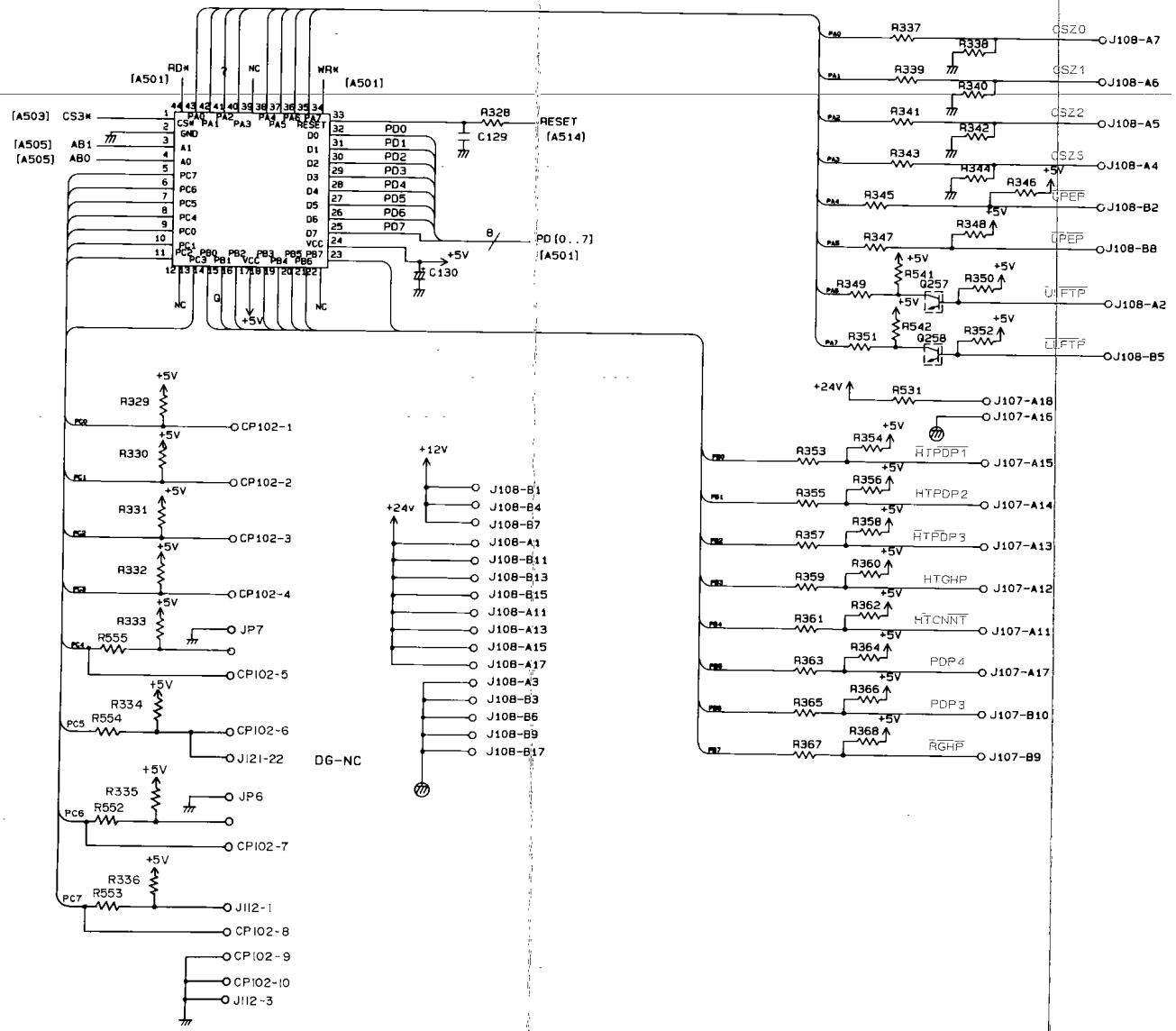

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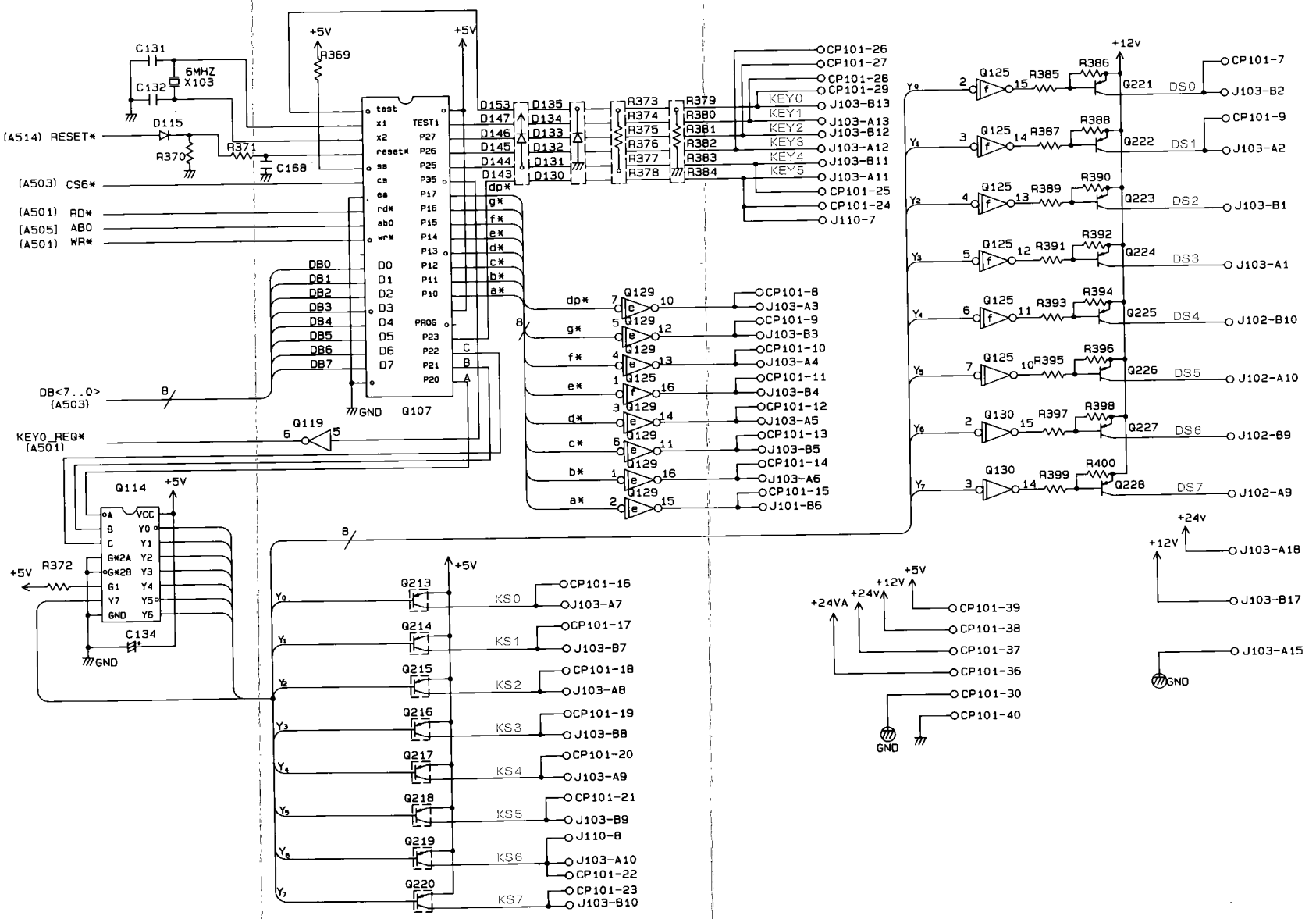

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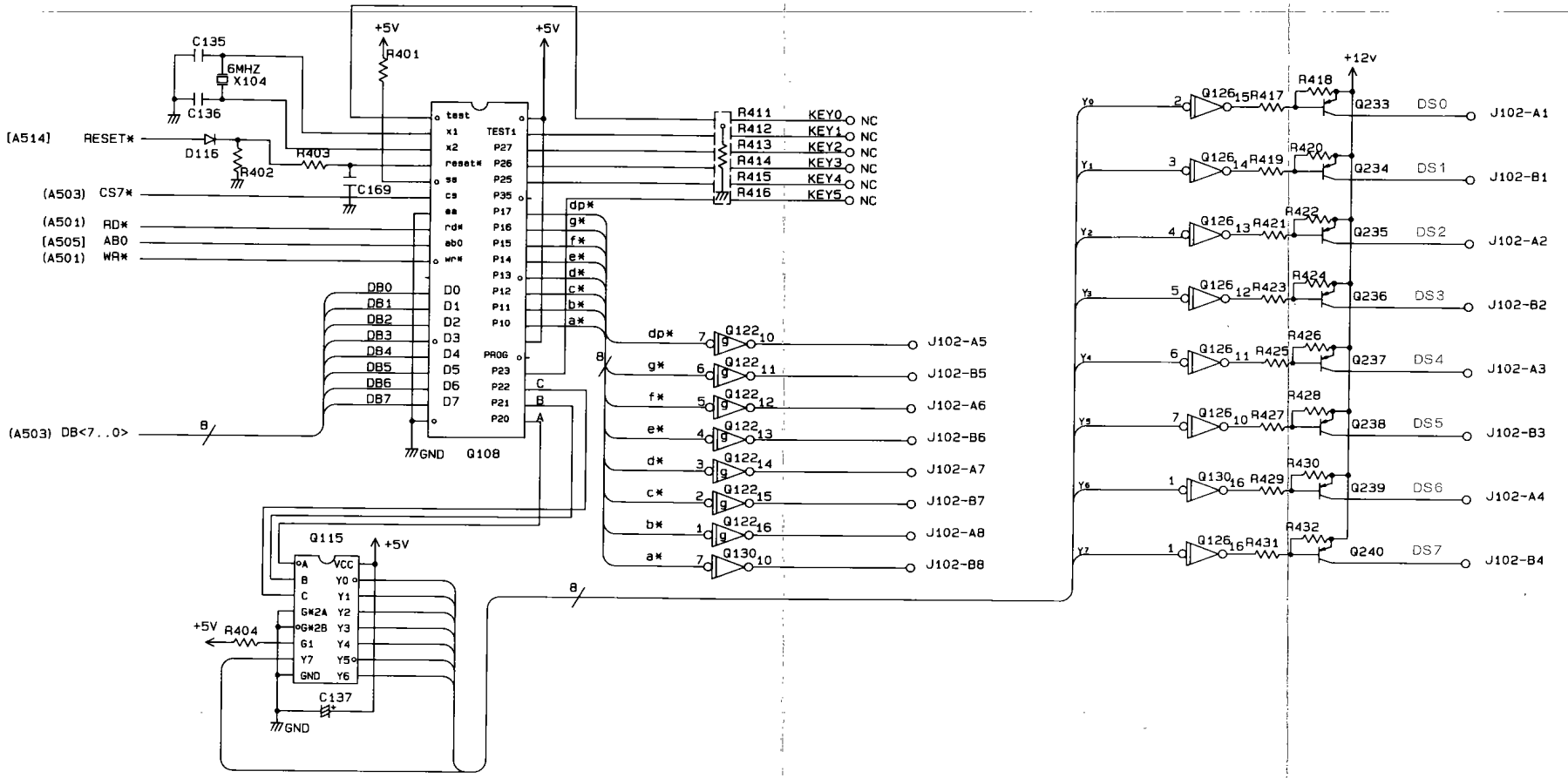

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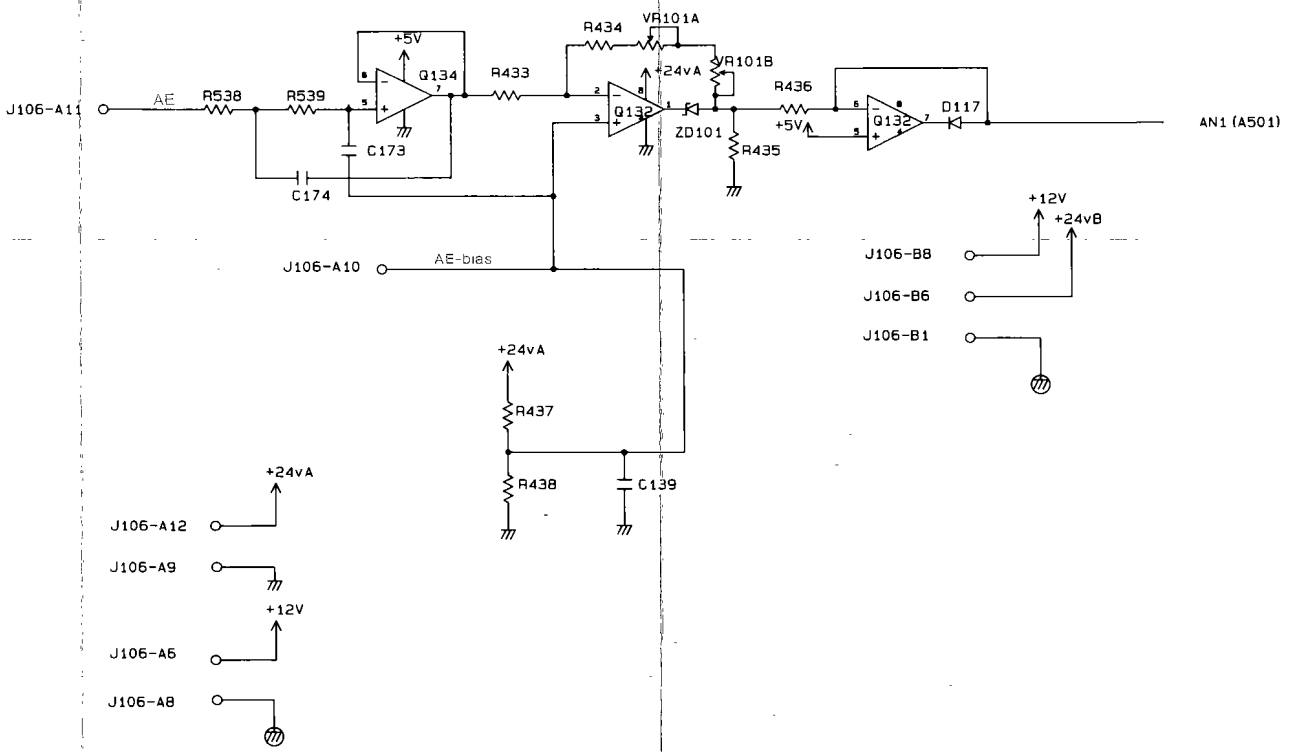

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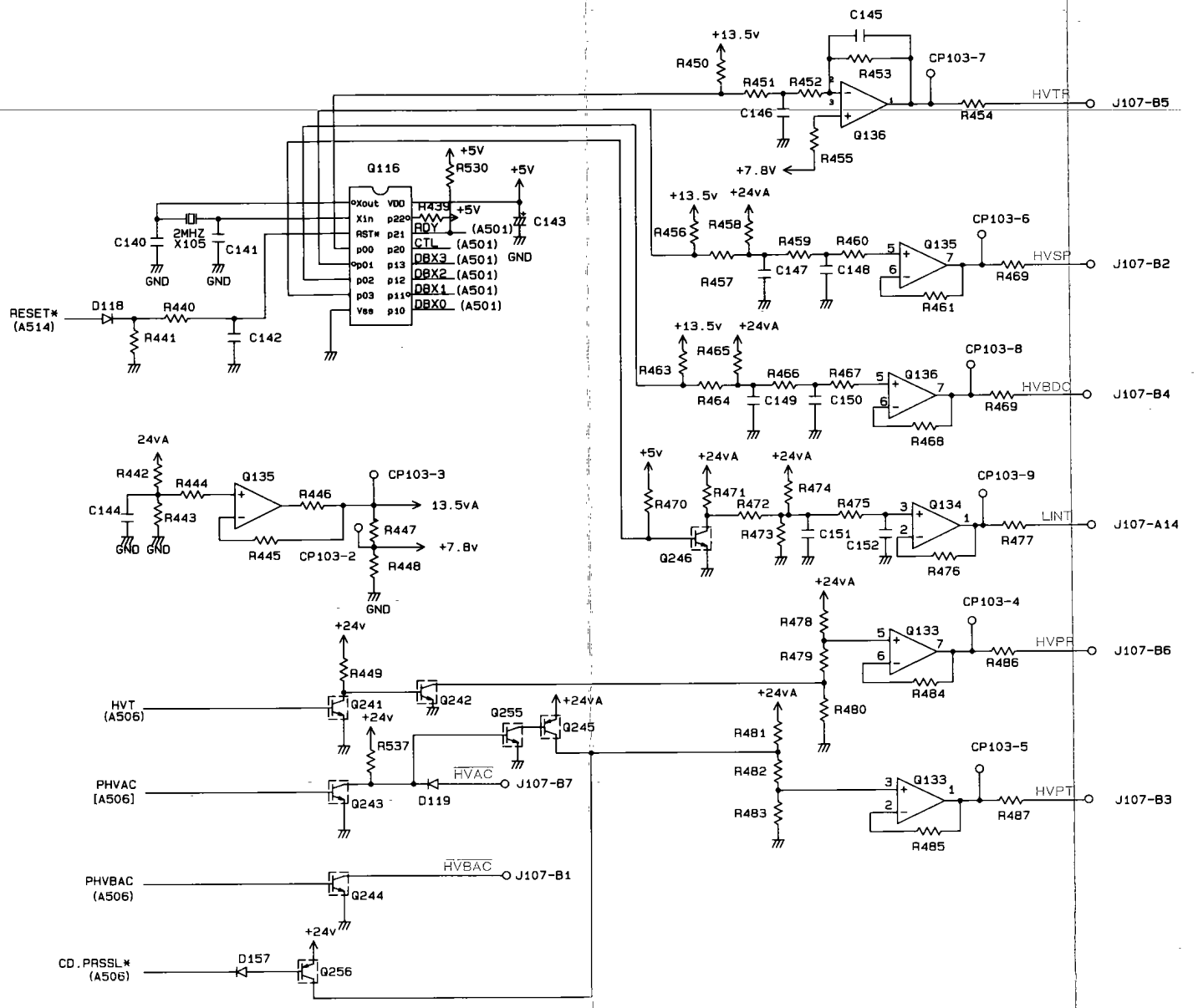

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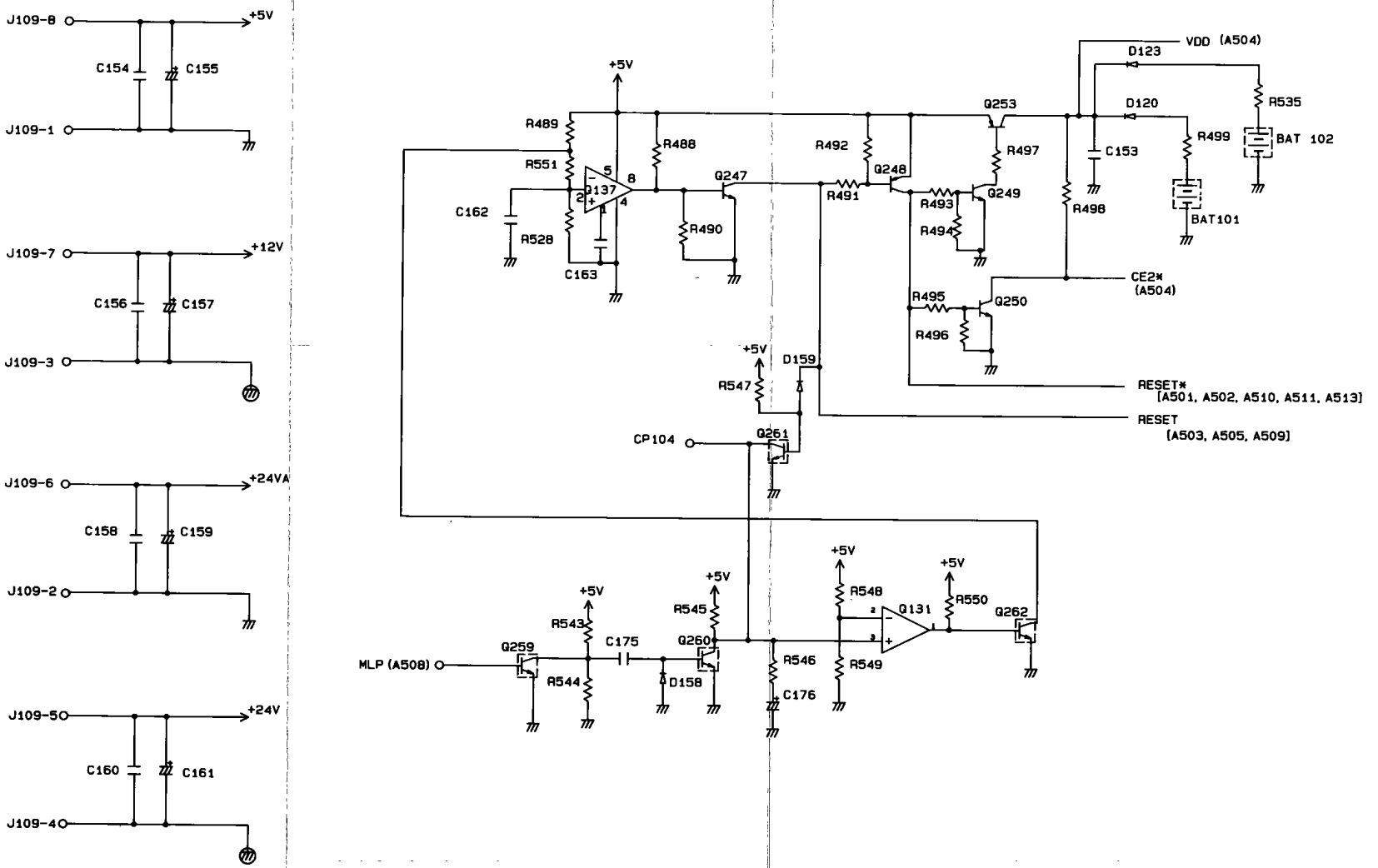

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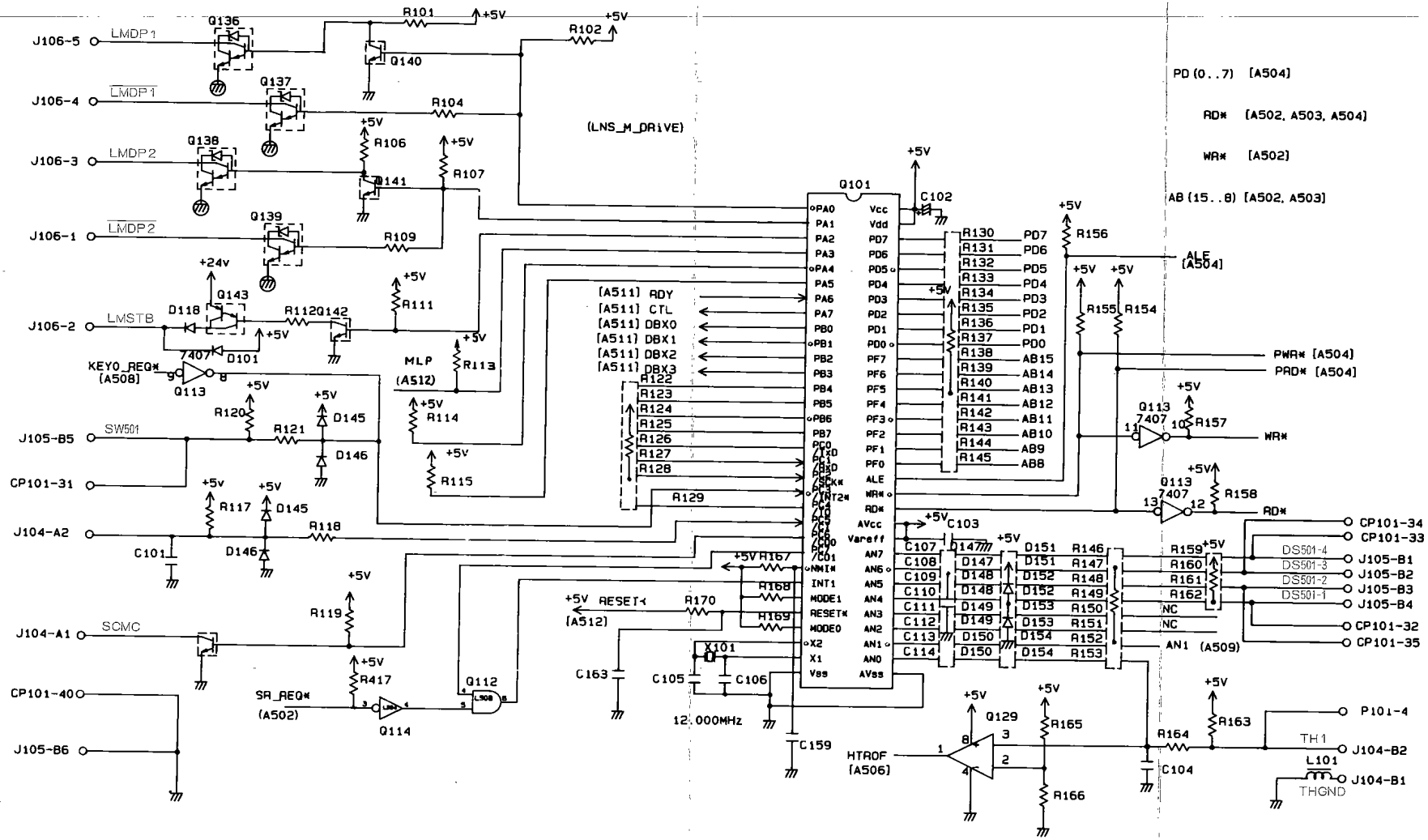

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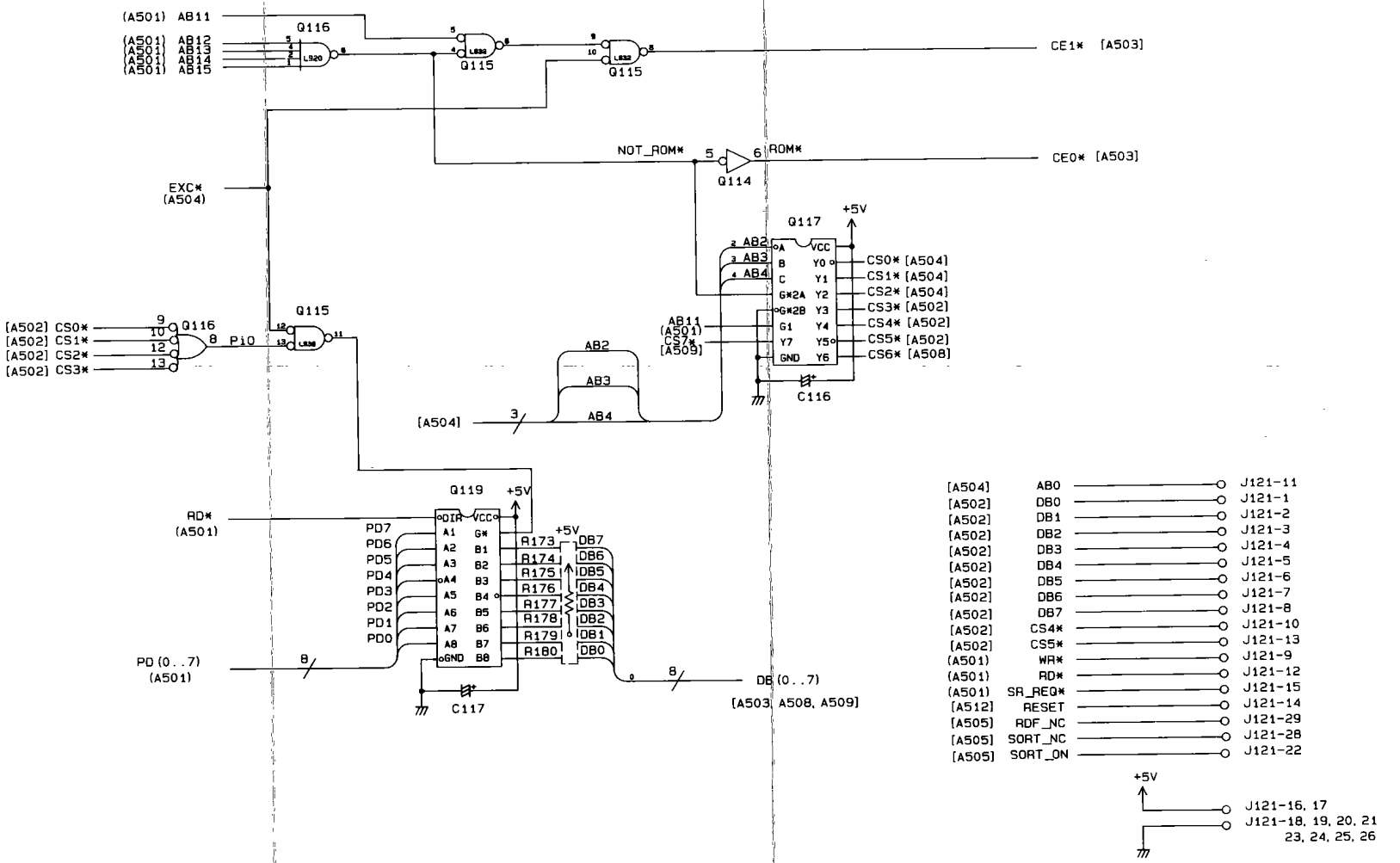

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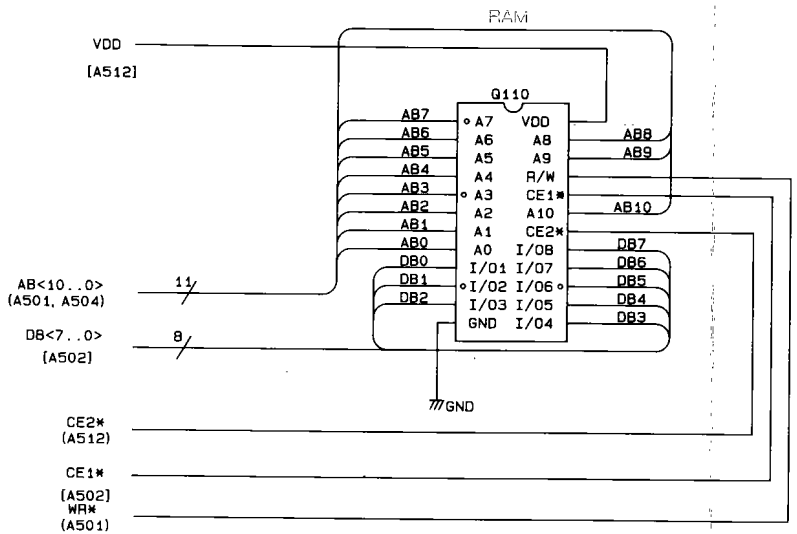

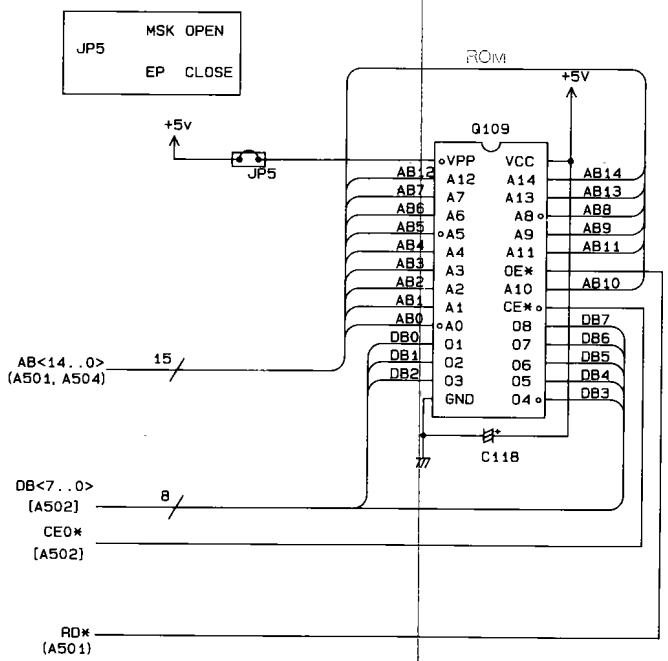

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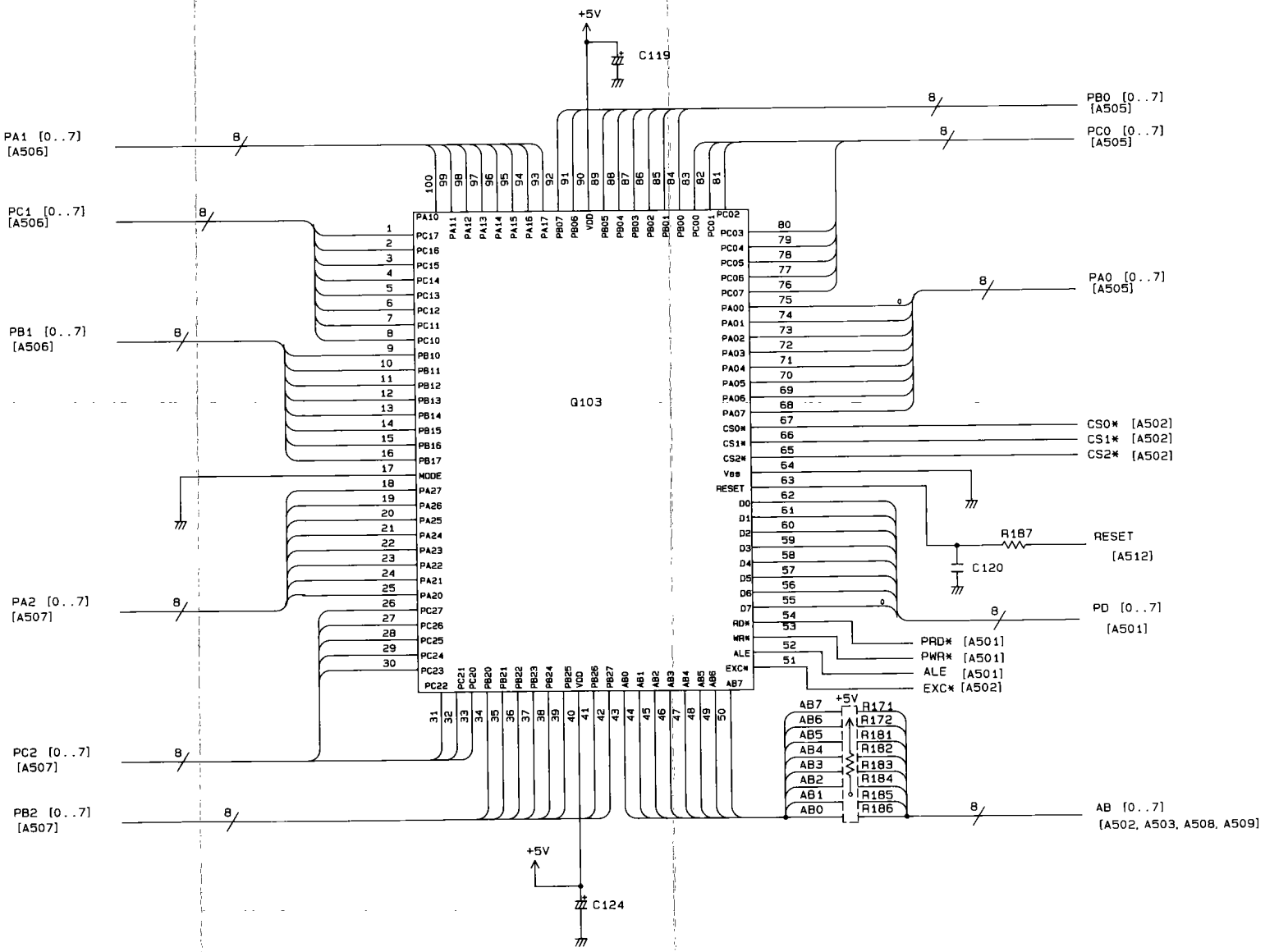

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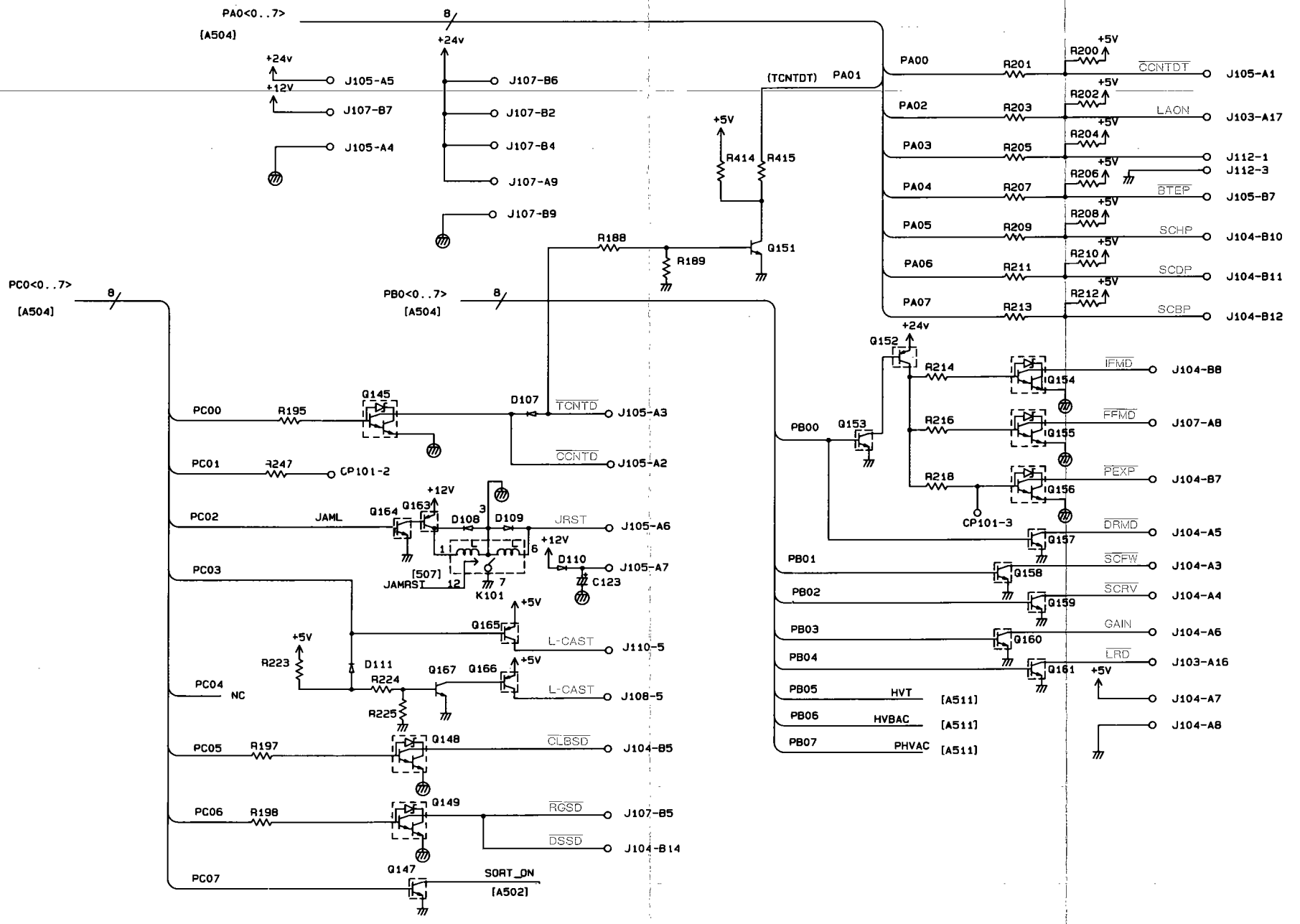

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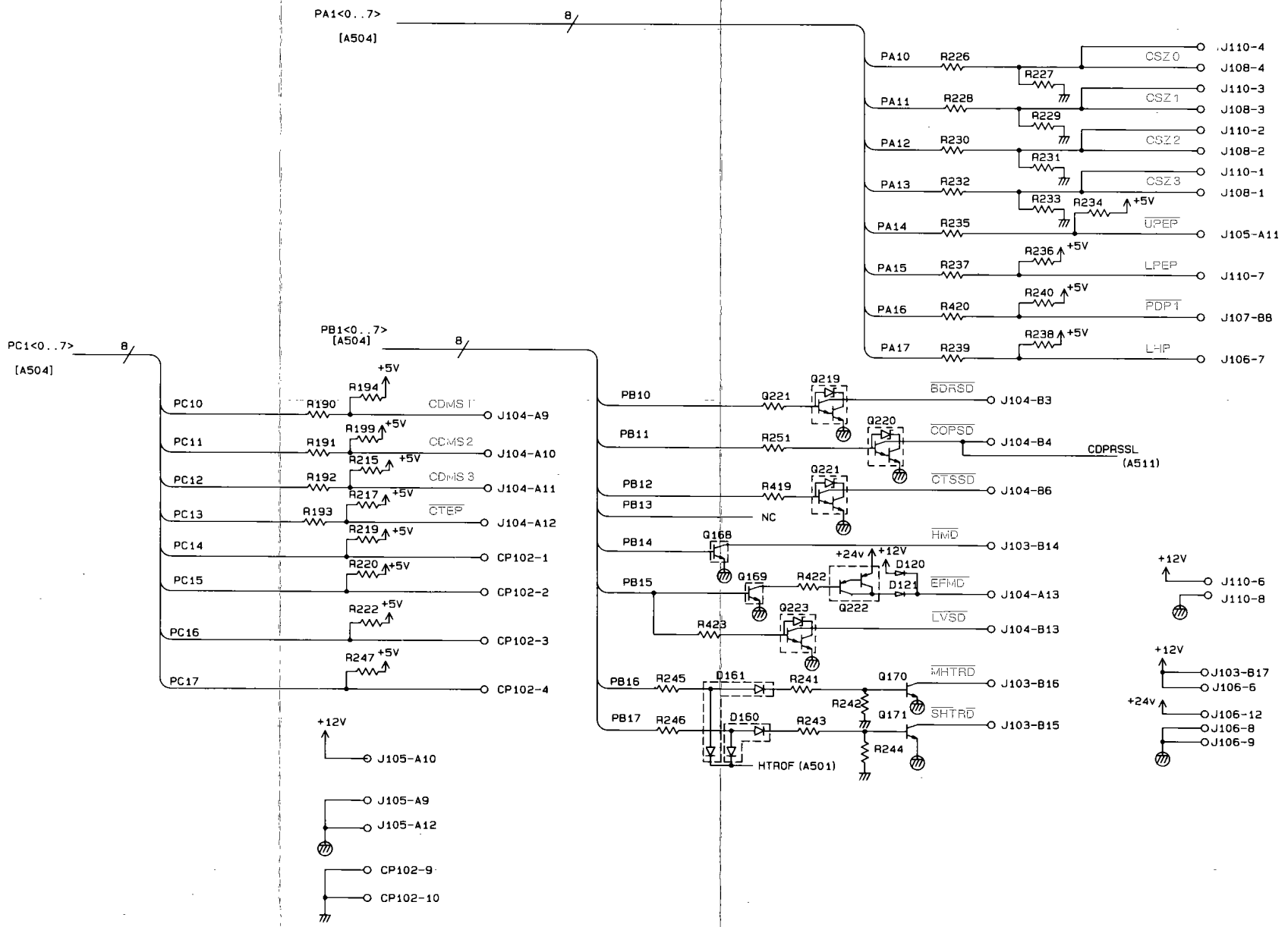

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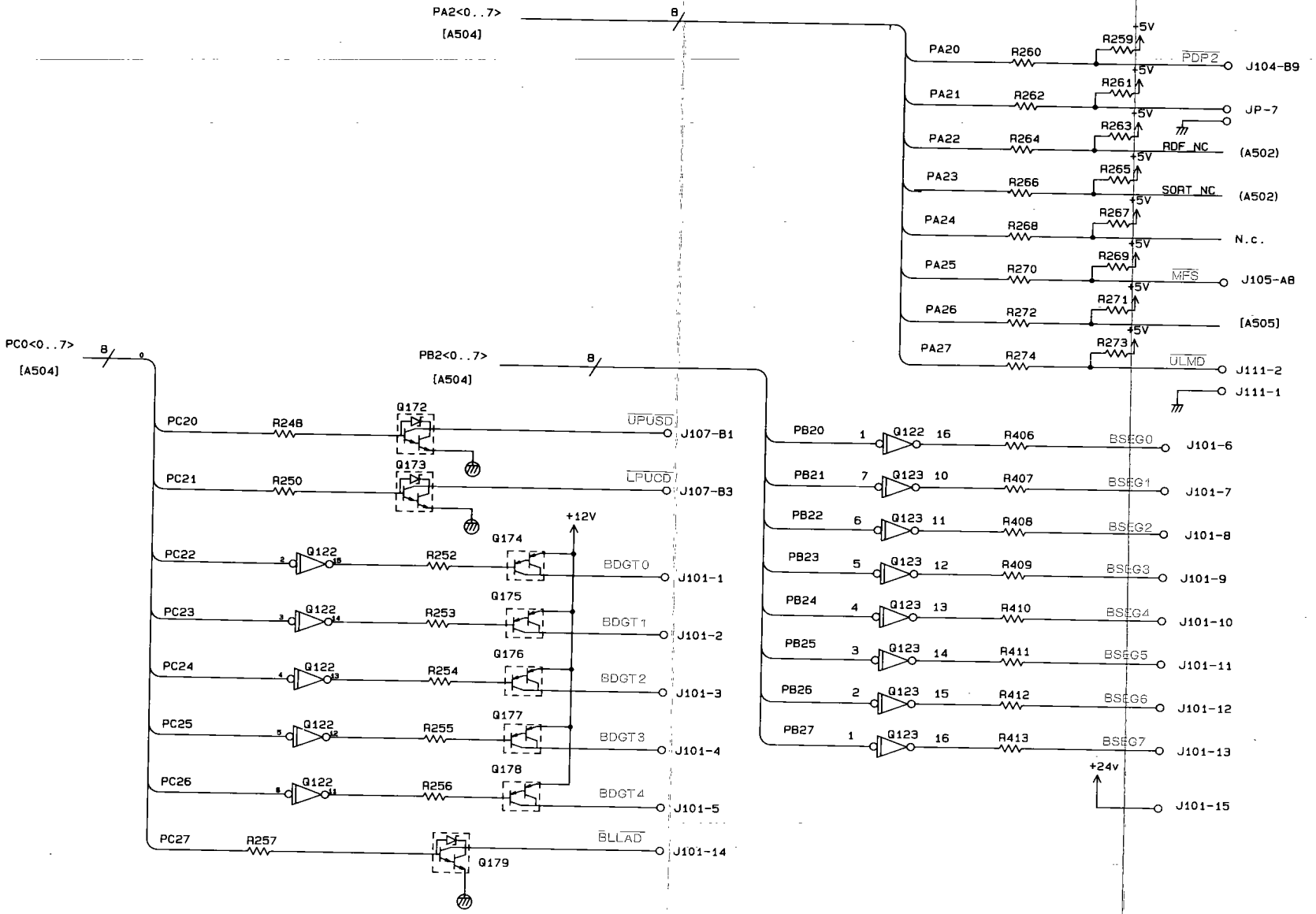

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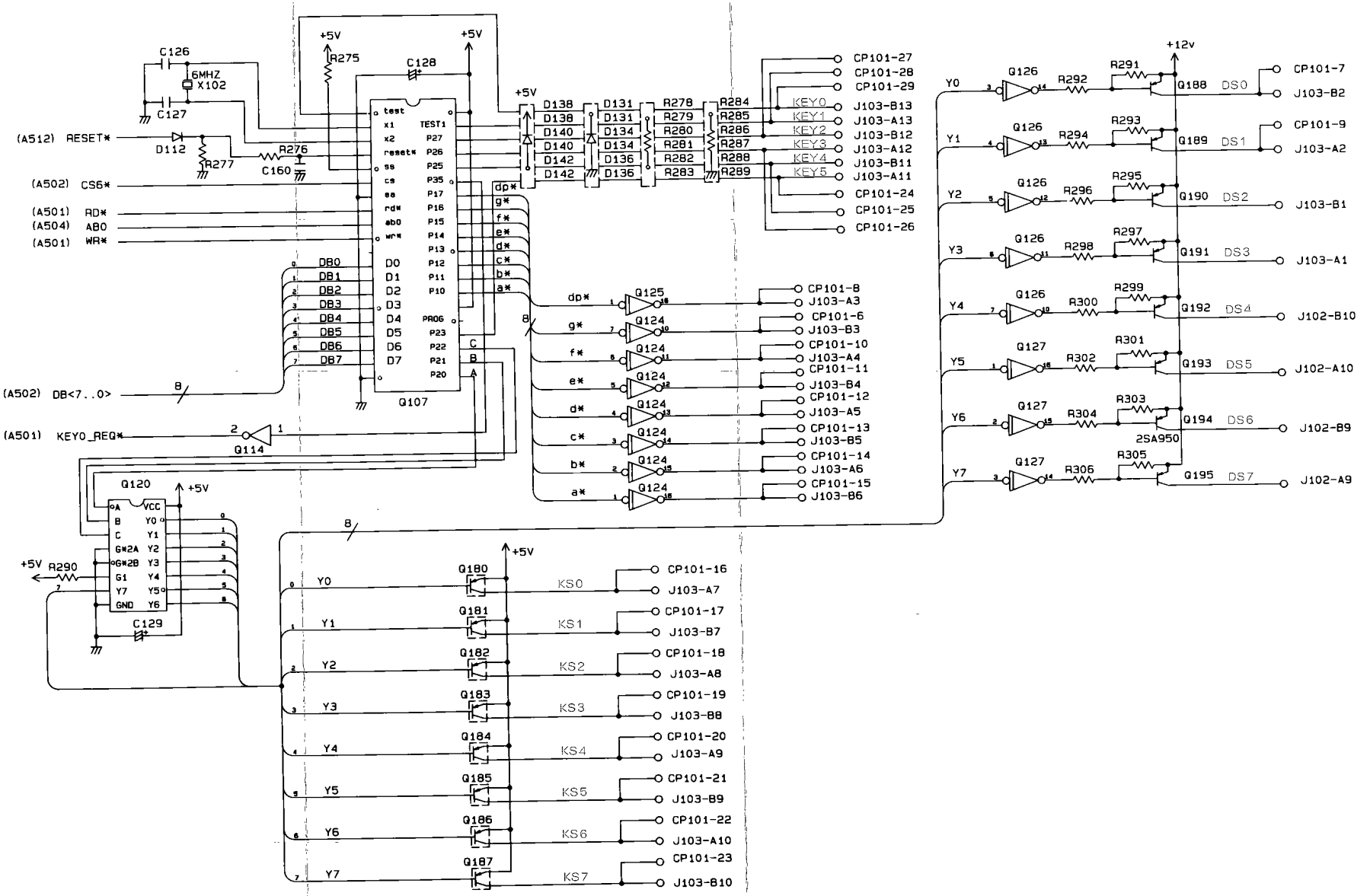
NP-3225/3025 DC CONTROLLER (8/12: A508)
Keys/displays drive (1)



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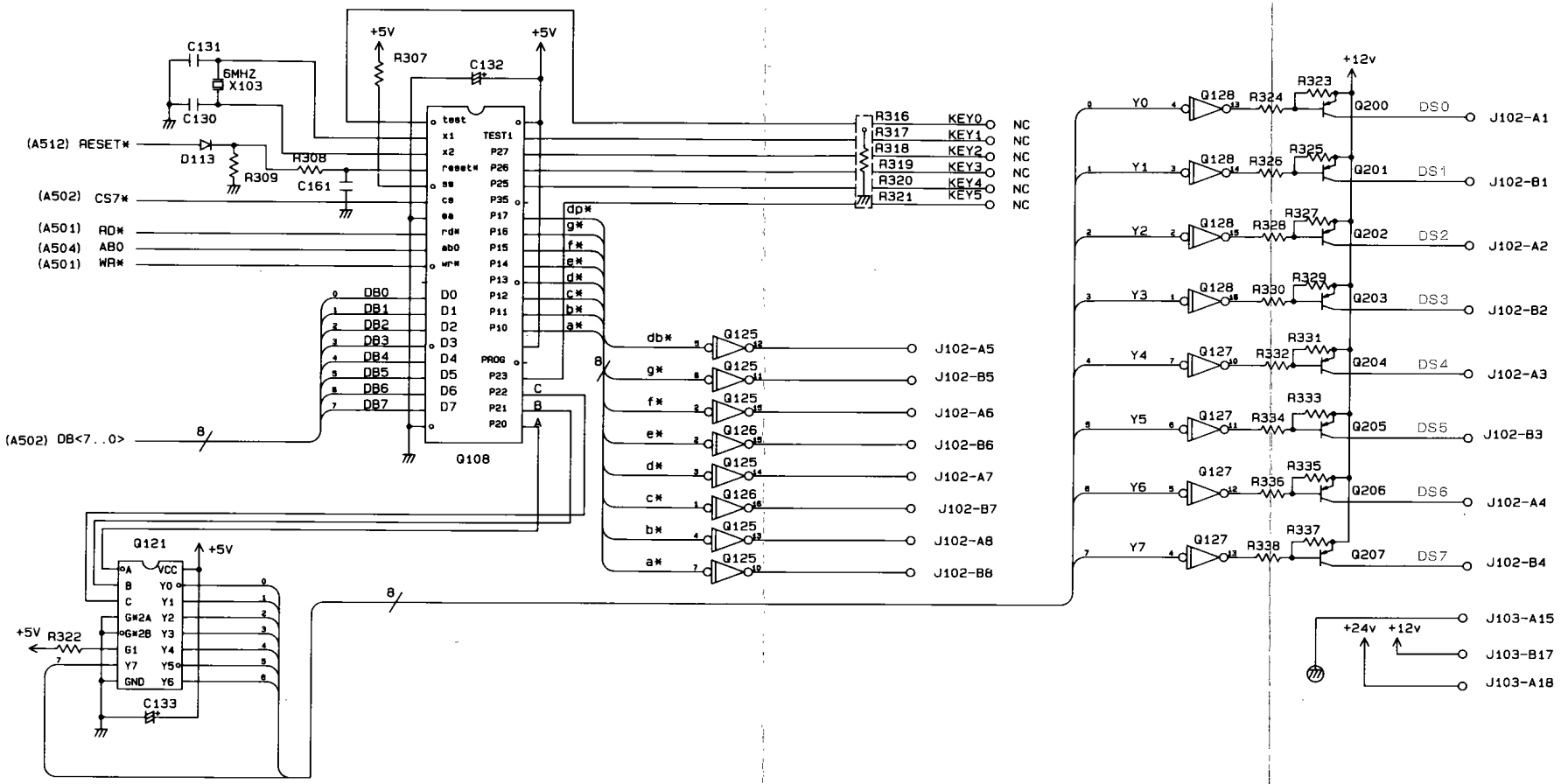

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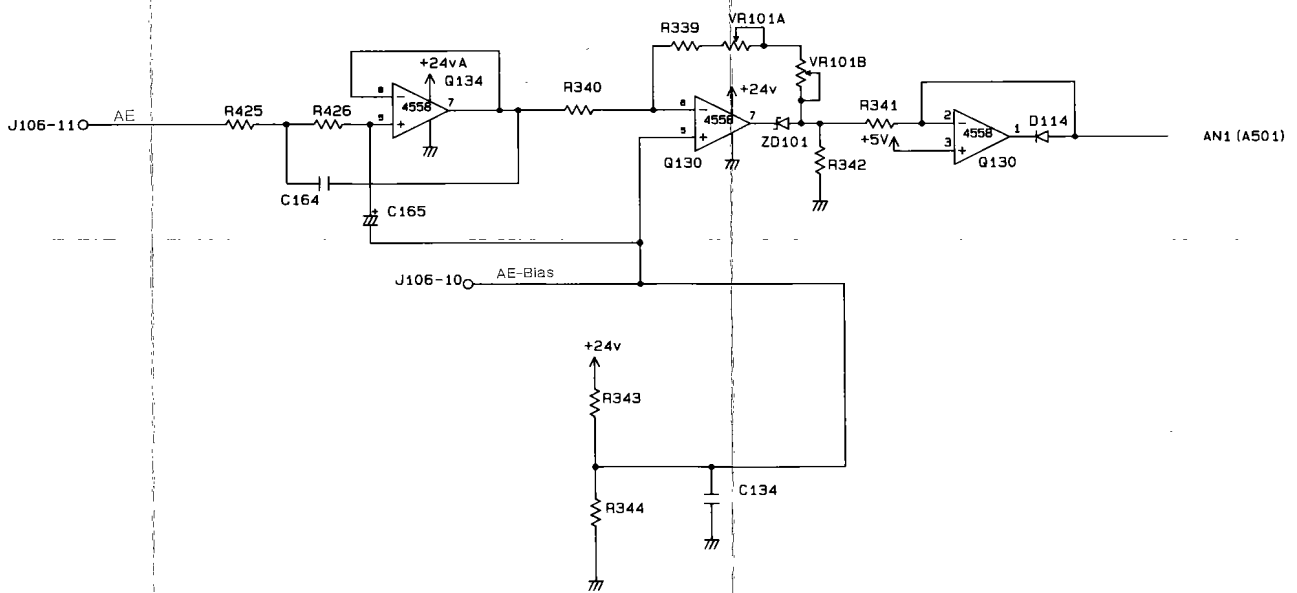

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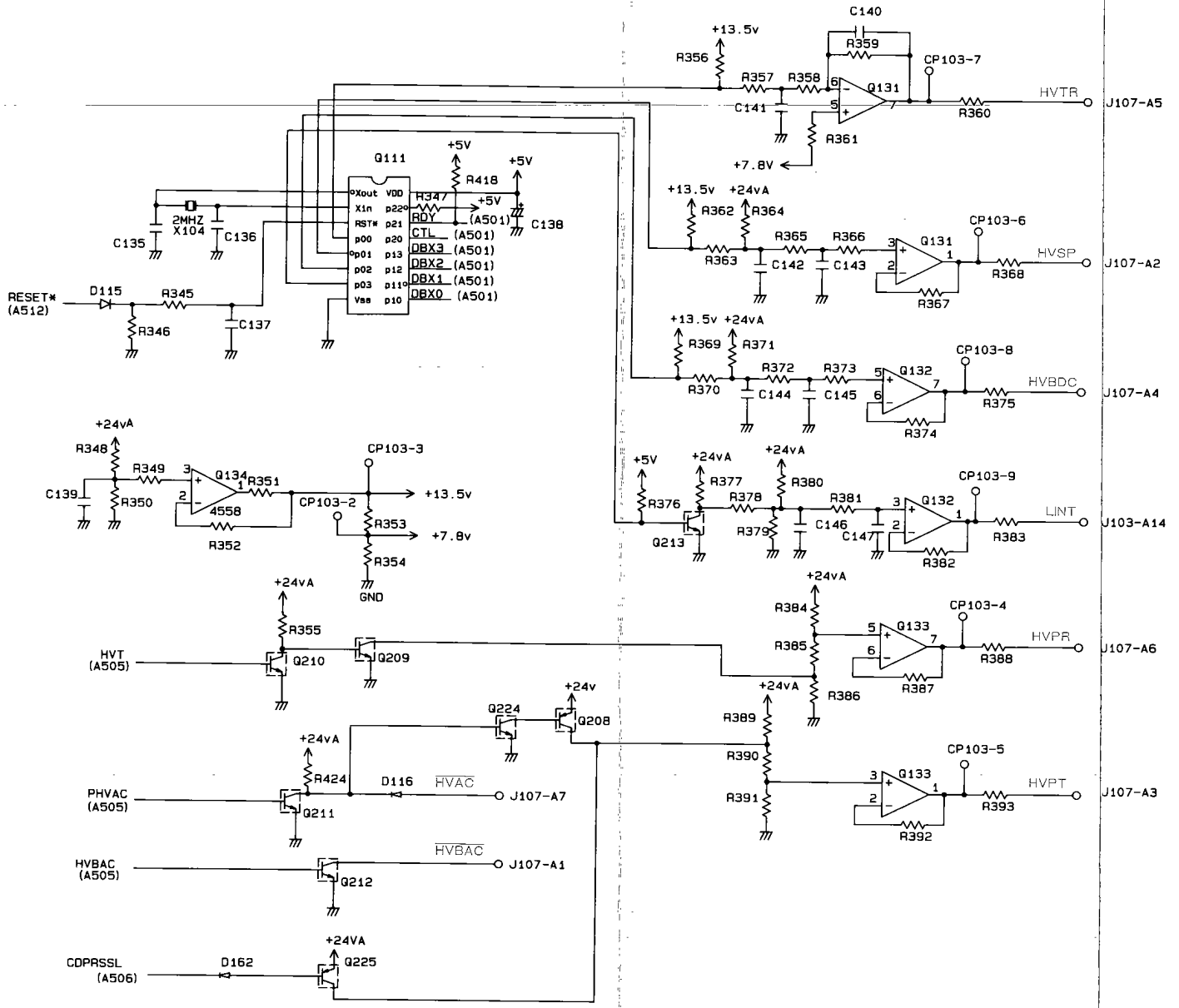

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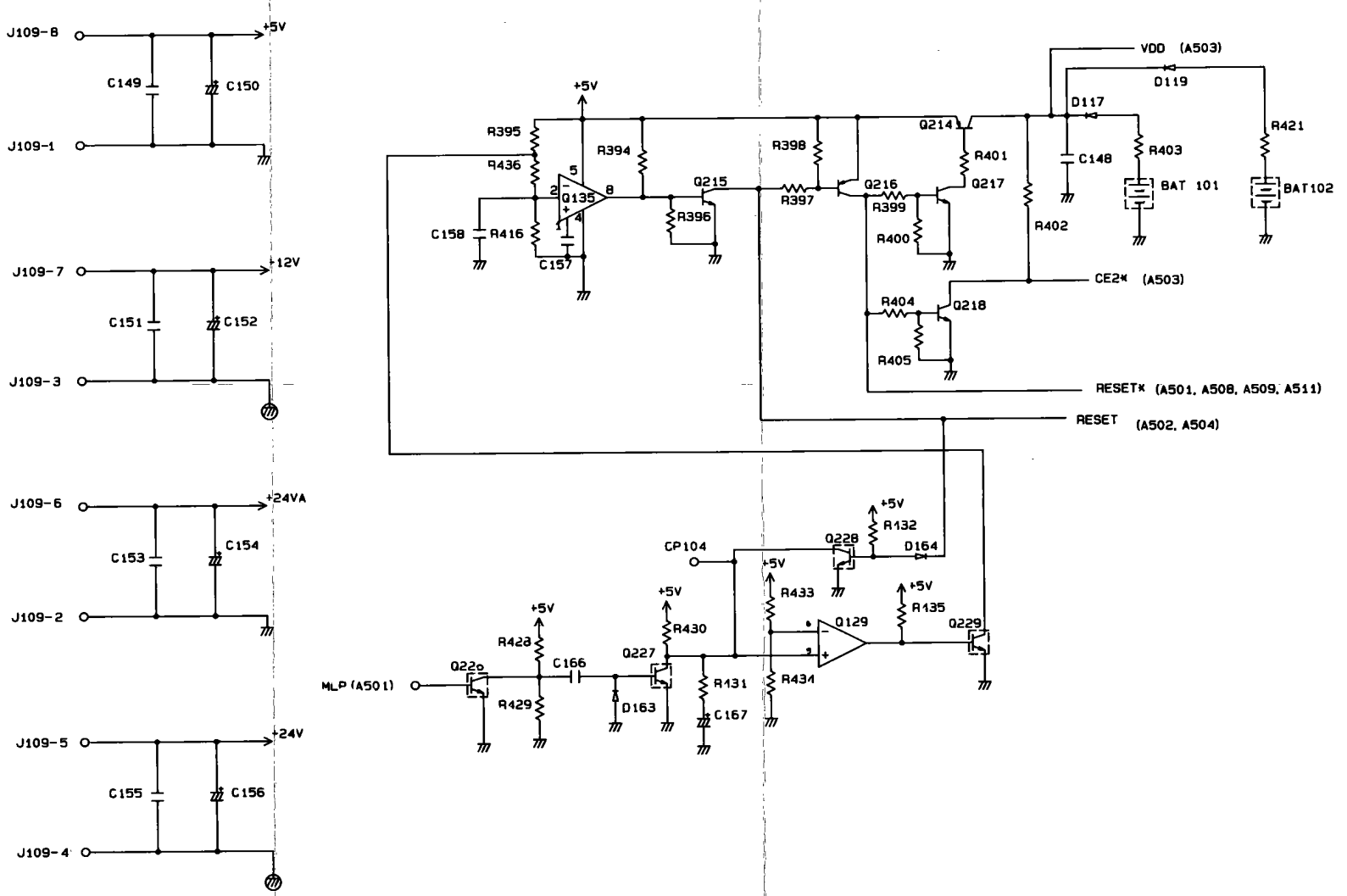

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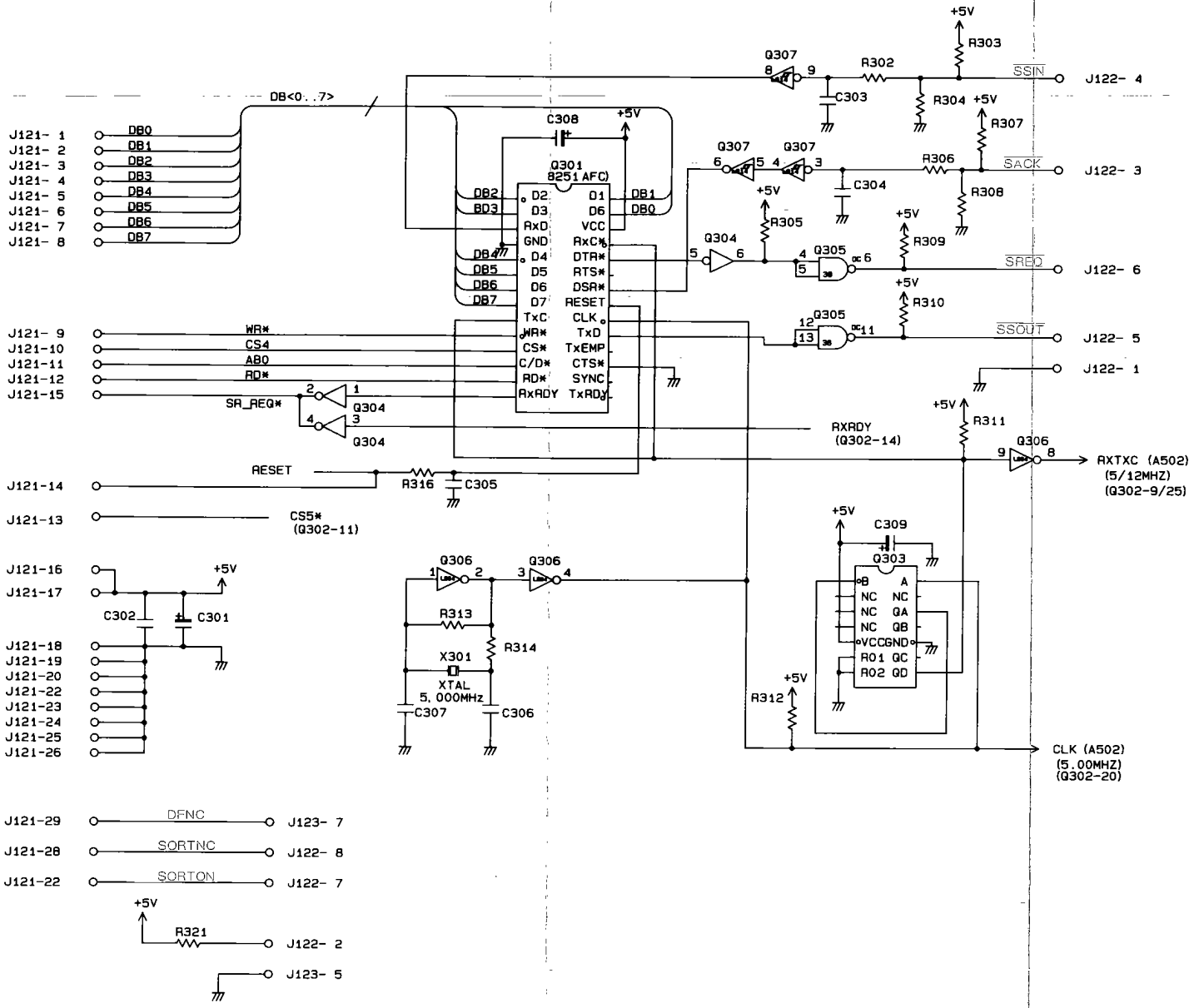

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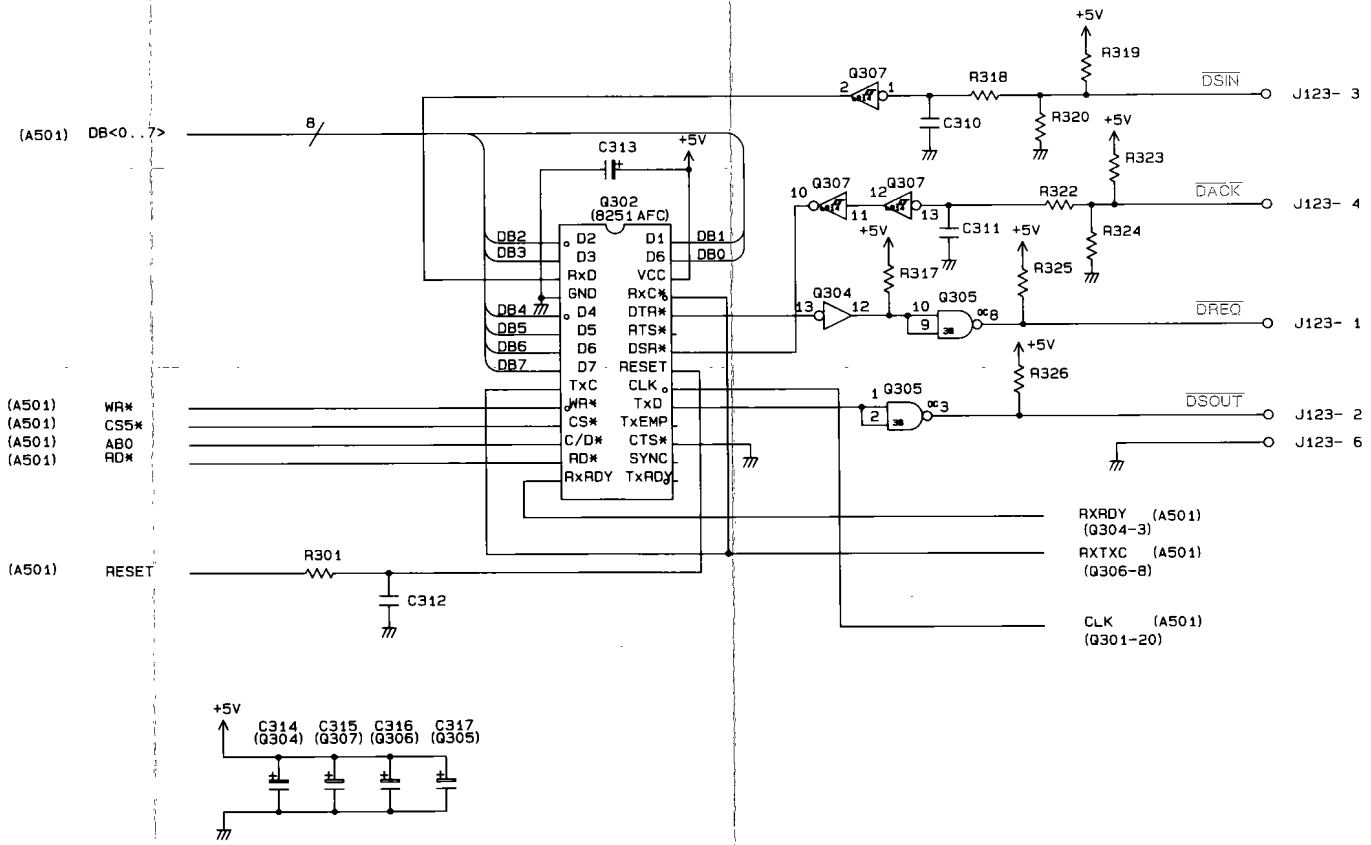

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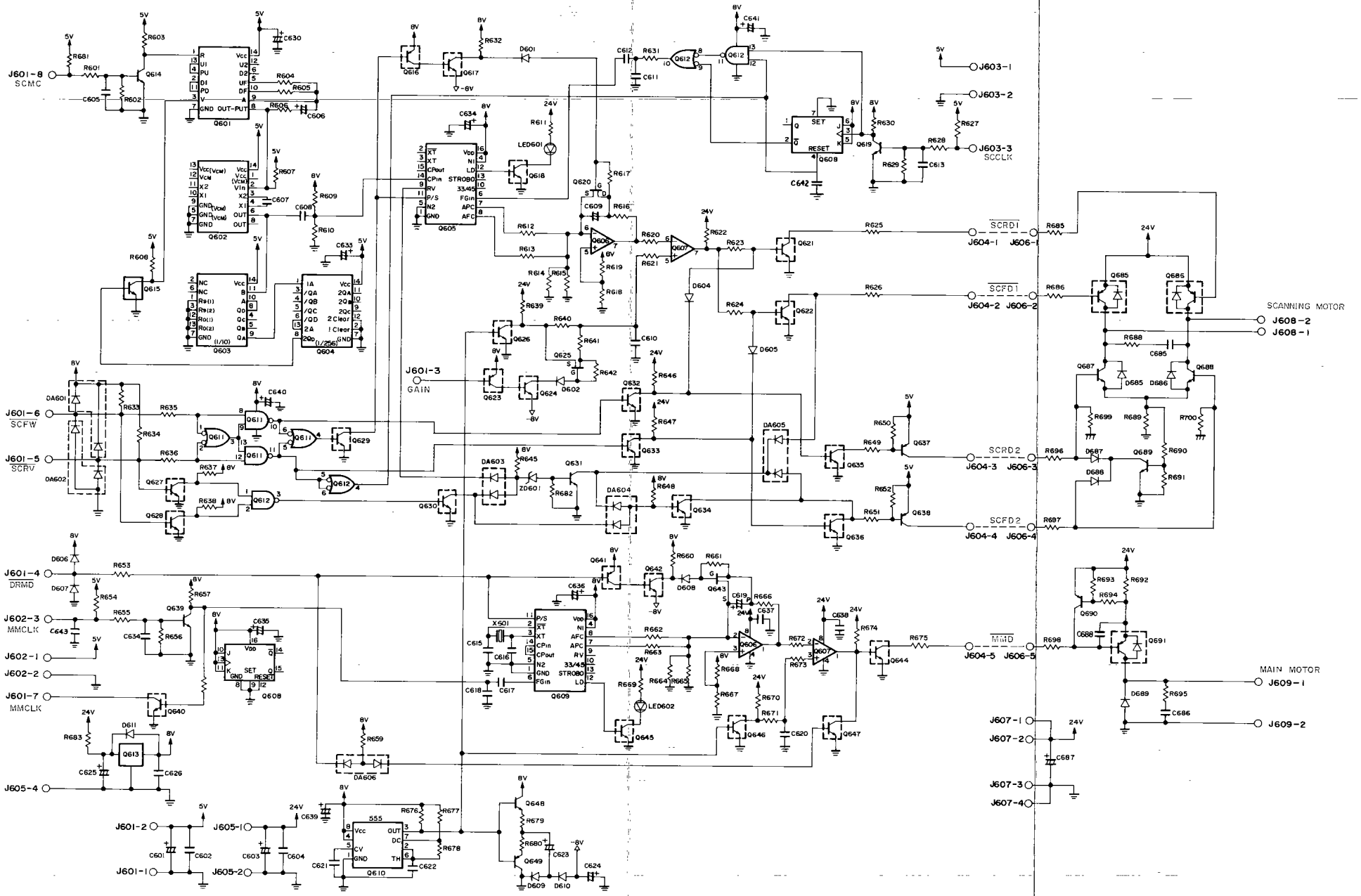

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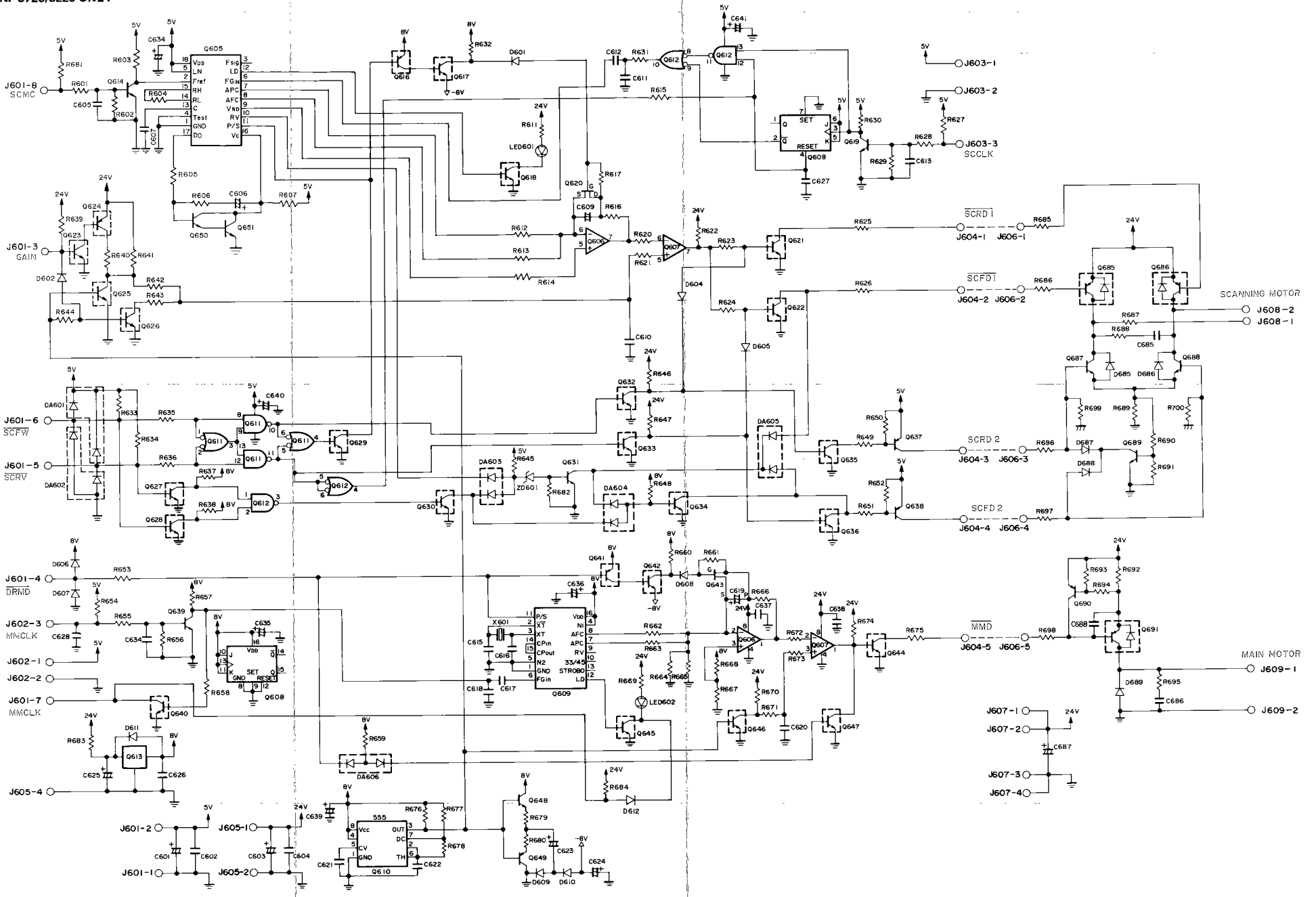
6A. MOTOR CONTROLLER/DRIVER PCB
NP-3725/3225 ONLY



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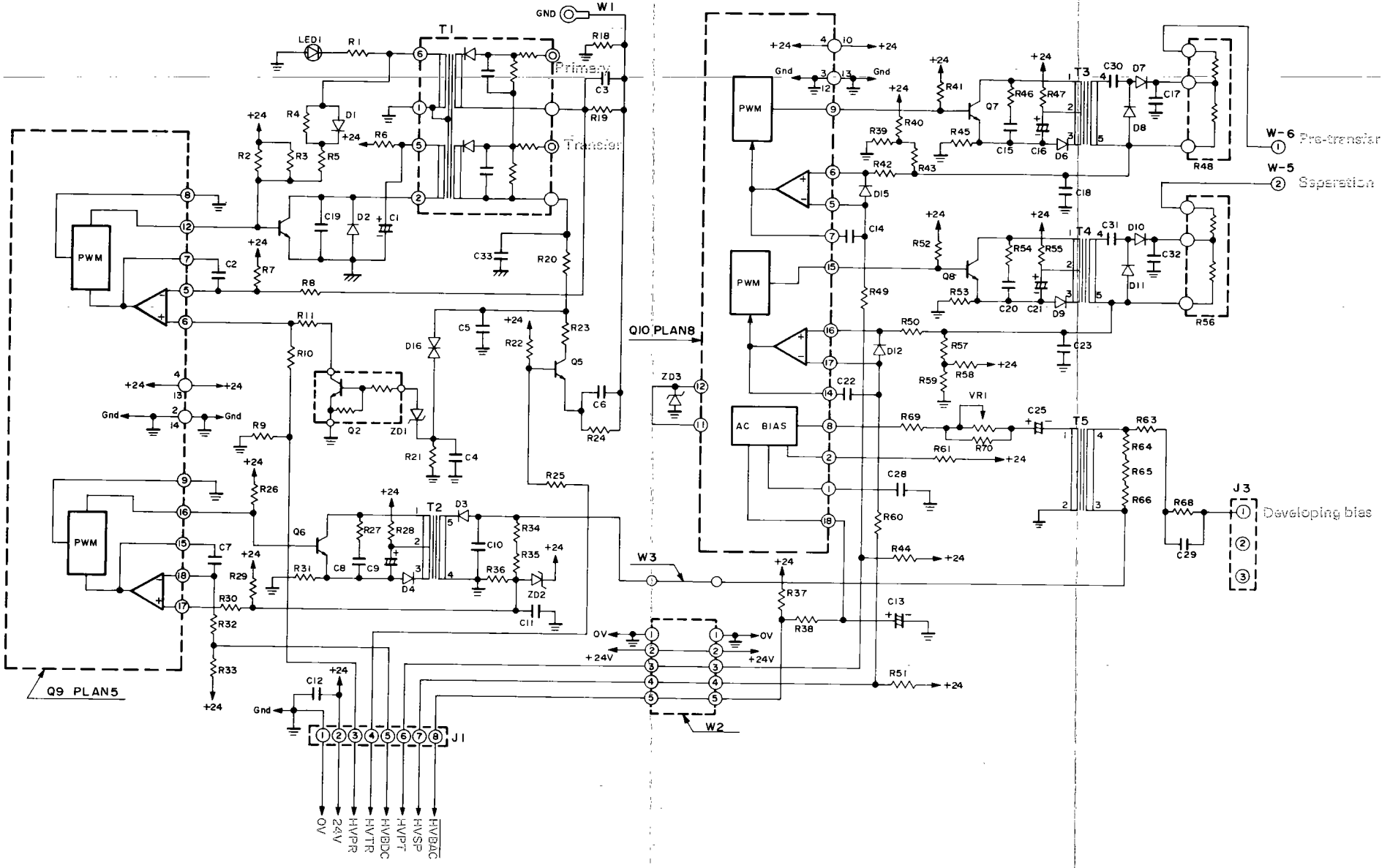

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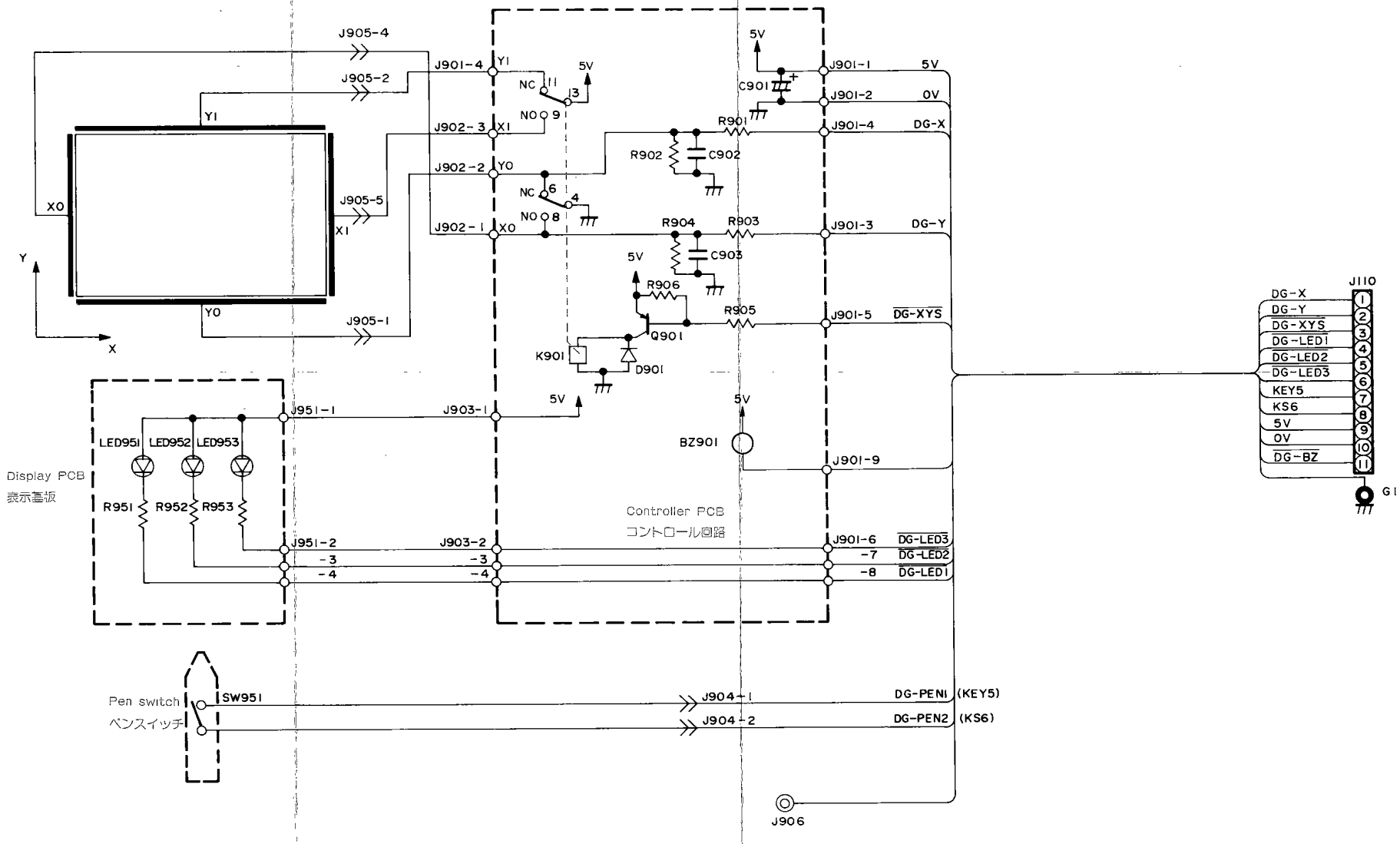

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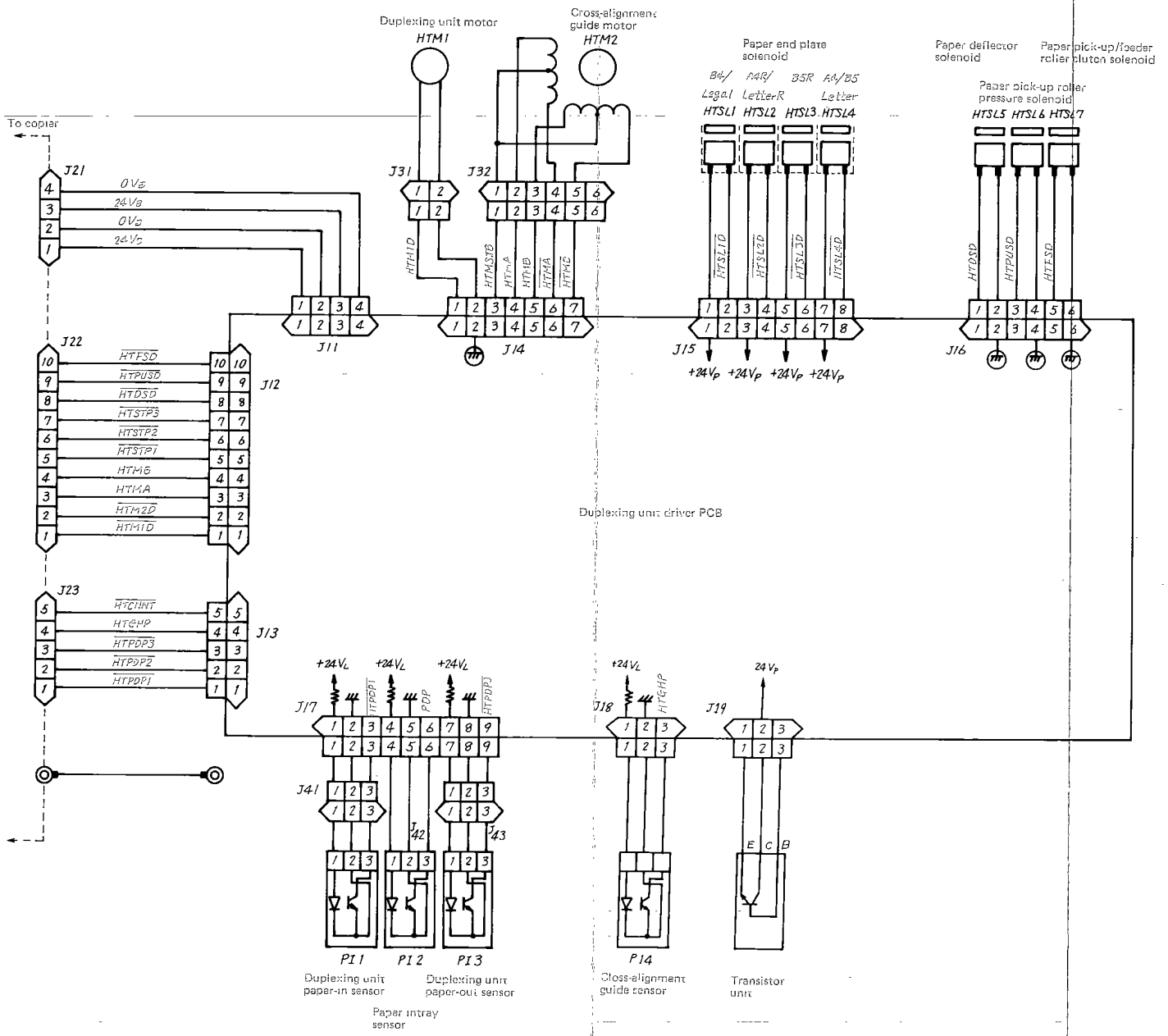

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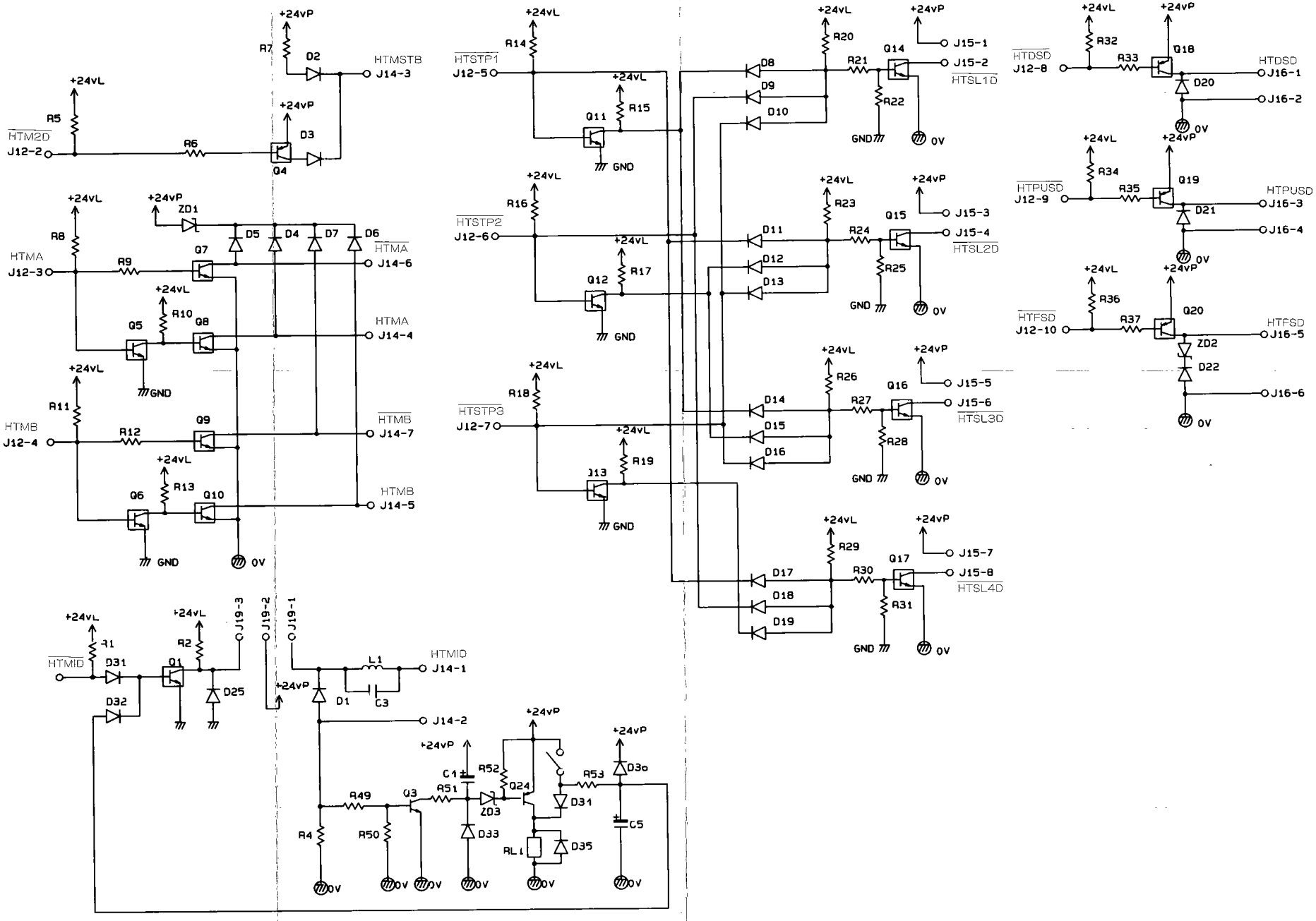
10. DUPLEXING UNIT DRIVER PCB

DUPLEXING UNIT DRIVER PCB (1/2: A501)



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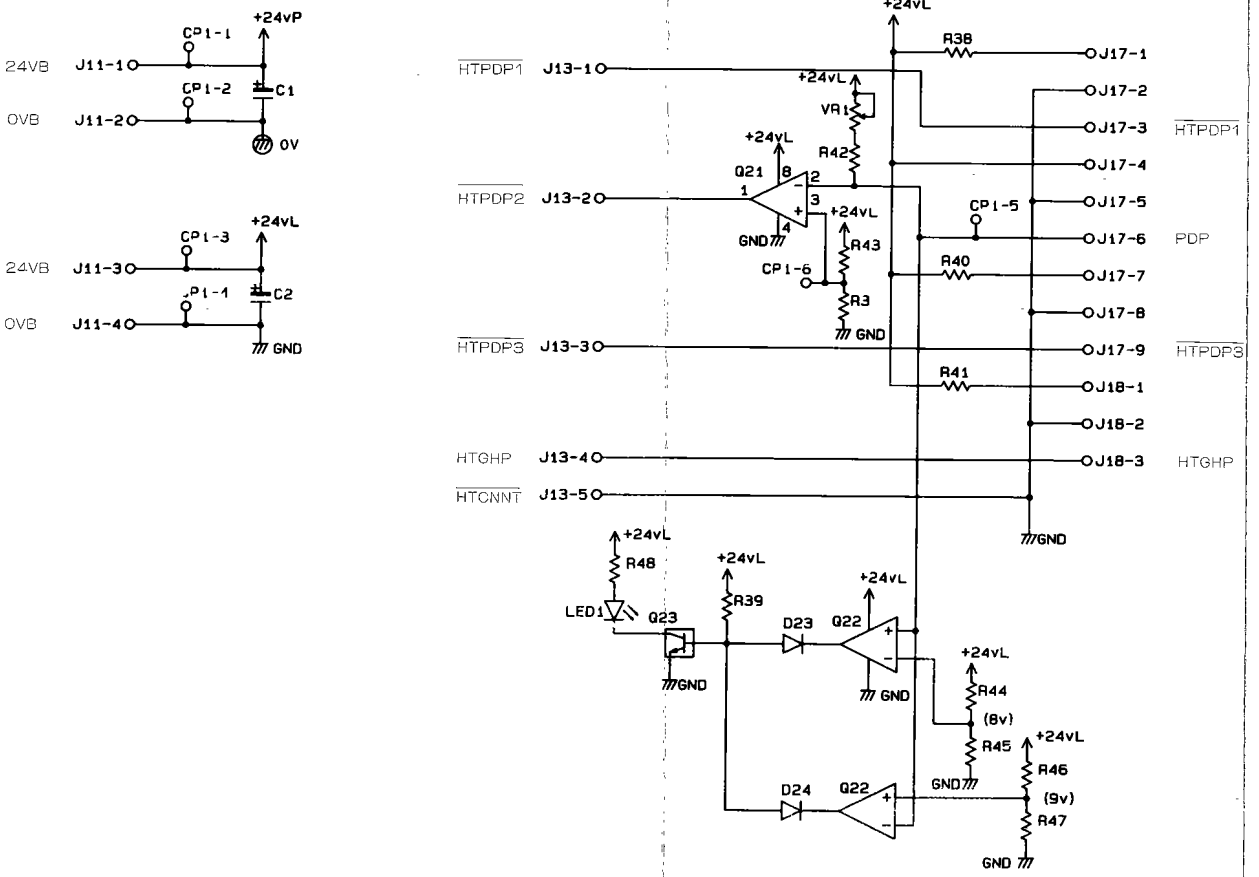

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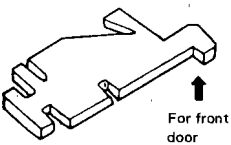
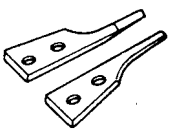
11. LIST OF SPECIAL TOOLS

Special tools which are required for servicing this copier (in addition to the standard tool set) are listed below.

No.	Tool name	Tool No.	Shape	Code	Application/remarks
1	Door switch actuator	TKN-0093		A	
2	Spring scale (compression)	CK-0054		B	• Measuring strength of cassette springs • Adjusting lens-drive cable tension
3	Extension blades for pliers	CK-0426		B	For removing grip rings: 4 – 9 mm

Note: Rank

A: Each service technician should carry one with him.
B: A group of five service technicians should share one.
C: Each workshop should keep one.

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12. LIST OF SOLVENTS AND MATERIALS

No.	Material name	Use	Chemical formula, mixture ratio, etc.	Source	Remarks
1.	Ethyl alcohol (Ethanol) Isopropyl alcohol (Isopropanol)	Cleaning: copyboard, glass, mirror, etc.	C_2H_5OH $(CH_3)_2$ CHOH	Locally	Flammable. Use in a well-ventilated area. Avoid breathing concentrated vapor.
2.	MEK	Removing toner or oil stains	$CH_3 \cdot CO \cdot C_2H_5$ Methylethyl ketone	Locally	Flammable. Use in a well-ventilated area and avoid breathing concentrated vapor. Avoid contact with eyes of skin. Do not use for cleaning the drum, plastic molded parts, or corona wires.
3.	Heat-resistant grease	Lubricating the drive mechanisms, e.g., copyboard driving gear, fixing drive gear, fixing ass'y, etc.		CANON	Tool No.: CK-0427 (500g can) (Equivalent grease can be used, but should be able to withstand 200°C for extended periods of time.)
4.	Lubricating oil (low viscosity)	Lubrication points: Scanner rail, etc.	ISO VG 68 oil ESSO Febis K68 MOBIL Vactraoil No.2 SHELL Tonna oil T68	Locally	Equivalent oil can be used. Tool No.: CK-0451 (100cc)
5.	Lubricating oil (low viscosity)	Lubrication point: One-way clutch in pick-up control unit	ISO VG 220 oil ESSO Febis K220 MOBIL Vactraoil No.4	Locally	Equivalent oil can be used. Tool No.: CK-0524 (100cc)
6.	Detergent	Cleaning covers and panels of the machine	Mild detergent solution	Locally	Dish-washing detergent is acceptable.
7.	Trichloro-ethylene	Cleaning oil-stained parts during overhaul	CH_3CCl_3	Locally	Use in well-ventilated area. Avoid breathing vapor. Avoid contact with eyes, or excess contact with skin.

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